

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

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CONTENTS

Editorial Comment :							PAGE
Nine Years After	899
A Fine Flight	900
R.A.F. Display for the Sultan of Muscat	901
The Graf Zeppelin	..	..	..	..	..	..	902
Royal Aero Club Official Notices	..	..	..	..	..	..	903
U.S. National Air Races and Aero Show	..	..	..	..	..	..	904
Berlin International Aero Show	..	..	..	..	..	..	907
Private Flying: A West of Ireland Tour:	By Lady Heath	..	..	..	..	..	923
Light 'Plane Clubs	..	..	..	..	..	..	925
Portuguese Flight to Africa	..	..	..	..	..	..	926
Airisms From the Four Winds	..	..	..	..	..	..	927
Royal Air Force	..	..	..	..	..	..	928
Society of Model Aeronautical Engineers	..	..	..	..	..	..	928

EDITORIAL COMMENT



HERE can, we think, be very little doubt that the Germans had a very definite motive in sending the new Zeppelin airship "Graf Zeppelin" across the Atlantic just when they did. It is not difficult to imagine that, what with the great international Aero Show in Berlin and the new airship ready for an extended cruise, the intention was by a flight that would draw the eyes of the world to impress upon that world the fact that the time for Germany's resurrection in the air is at hand. The flight of the airship certainly did cause the whole world to "take notice," but whether the general effect is altogether what had been planned is, perhaps, rather doubtful. We are not now referring to the somewhat unfortunate friction between the airship travellers and American officials. To these "incidents" we attach but little importance. It should be realised that the nerves of the Zeppelin crew were in all probability "on edge" after a very trying trip. Moreover, the language difficulty may easily have given rise to misunderstandings which led to an interpretation of words and actions which the actual circumstances did not altogether justify. Due allowance should be made for this, and such minor frictions should not be permitted to assume an undue importance.

What we are concerned with here is the cruise itself, the lessons, if any, which have been learned, and the conclusions which one may draw from the experience. Newspaper accounts appear to indicate that experts in the various countries are divided on the subject of whether the flight of the "Graf Zeppelin" should be written down a success or a failure. It is not difficult to produce arguments in favour of both views. The airship enthusiasts may, and probably do, claim that the fact that the airship was able, in spite of damage to her port tail plane, to complete her journey in safety although somewhat late, has proved that the modern airship is by no means a fair-weather craft, but capable of extended flights in very adverse weather conditions. Herr Eckener is reported to have stated that the breaking of a tail plane is not likely to occur again.

"FLIGHT" PHOTOGRAPHS

To those desirous of obtaining copies of "Flight" photographs, these can be supplied, enlarged or otherwise, upon application to Photo. Department, 36, Great Queen Street, W.C.2.

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1928

- Oct. 7-28 International Aircraft Exhibition, Berlin
- Oct. 18 Lecture, "Light Alloys and Their Use in Aircraft," by H. Sutton, before R.Ae.S.
- Oct. 24.... Aero Golfing Soc.—"Cellon" Challenge Cup
- Nov. 1 Lecture, "Testing of Adhesives for Timber," by W. D. Douglas, before R.Ae.S.
- Nov. 8.... Lecture, "Machinery Installation of R.101," by Wing-Com. T. R. Cave-Browne-Cave, before R.Ae.S.
- Nov. 15.... Lecture, "Aeroplane Engines in Flight," by R. J. Penn, before R.Ae.S.
- Nov. 22.... Lecture, "Weight of Aircraft," by Maj. T. M. Barlow, before R.Ae.S.

The inference is, of course, that but for the damaged tail surface, the airship would have made better time and have reached Lakehurst nearer the time originally expected.

The antagonists of the airship, on the other hand, will point to the long time occupied in making the crossing, resulting in no saving in time as compared with that taken by an ocean liner. Also they will say, and apparently with some justification, that the passengers suffered considerable discomfort, much more so than they would have done in a surface vessel even in very rough weather.

To us it appears that the flight of the "Graf Zeppelin" has proved nothing whatever one way or the other. The weather was certainly far from favourable, and strong headwinds encountered over certain stages of the journey caused great delay. On the other hand, if airships are to be of any practical use, they will at times have to be capable of facing conditions much worse than those met by the Zeppelin. It is no use trying to shelter under the excuse that the airship is a new invention and still "in its childhood." As far as the Germans are concerned, at any rate, the rigid airship is not to be regarded as an experiment. But we do think that possibly the "Graf Zeppelin" was sent on this long journey somewhat prematurely and before a sufficient number of really exhaustive test flights had been made. In

other words, to put it quite bluntly, the Germans were "in too much of a hurry" to impress the world.

One should not leave the subject of the Atlantic crossing by the "Graf Zeppelin" without a reminder that the first flight across by airship was successfully carried out nine years ago by the British rigid airship R.34, a much smaller vessel than the "Graf Zeppelin," in a shorter time. And also the return journey was made in 75 hours. The British airship had neither the range nor the carrying capacity of the latest German vessel, and thus her flight was in many ways more meritorious.

❖ ❖ ❖

A fine Flight

Although not yet completed, the first stages of the flight by Portuguese officers in Vickers "Valparaiso" biplanes with Napier "Lion" engines towards Mozambique must rank among the great flights of the year. Leaving Lisbon on September 5, the Portuguese aviators reached Bolama on September 9, having covered a distance of 2,570 miles in five days, or in an actual flying time of 24 hours 9 minutes, giving an average speed of more than 105 m.p.h. The next stage, to Portuguese West Africa, has probably been completed by now, and its earlier sections were again completed in good time. It is gratifying to find British materiel associated with such a fine performance.

R.A.F. DISPLAY FOR SULTAN OF MUSCAT

THE Royal Air Force gave a display at Hendon on October 11 in honour of the Sultan of Muscat. There was a clever demonstration of formation flying and other manœuvres. The programme commenced with converging bombing by Gloster "Grebes" of 25 (Fighter) Squadron, and a direct hit on the tent in the middle of the aerodrome was made. Armstrong-Whitworth "Siskins" of No. 29 (Fighter) Squadron carried out squadron drill; there was a take-off and fly past of Fairey III's of No. 207 (Bomber) Squadron; messages were picked up in formation by Armstrong-Whitworth "Atlas" machines of No. 26 (Army Co-Operation) Squadron. Squadrons Nos. 41, 32, 17 and 43 (Armstrong-Whitworth "Siskins") took off. Two Gloster "Gamecocks" of No. 23 (Fighter) Squadron gave an exhibition of individual

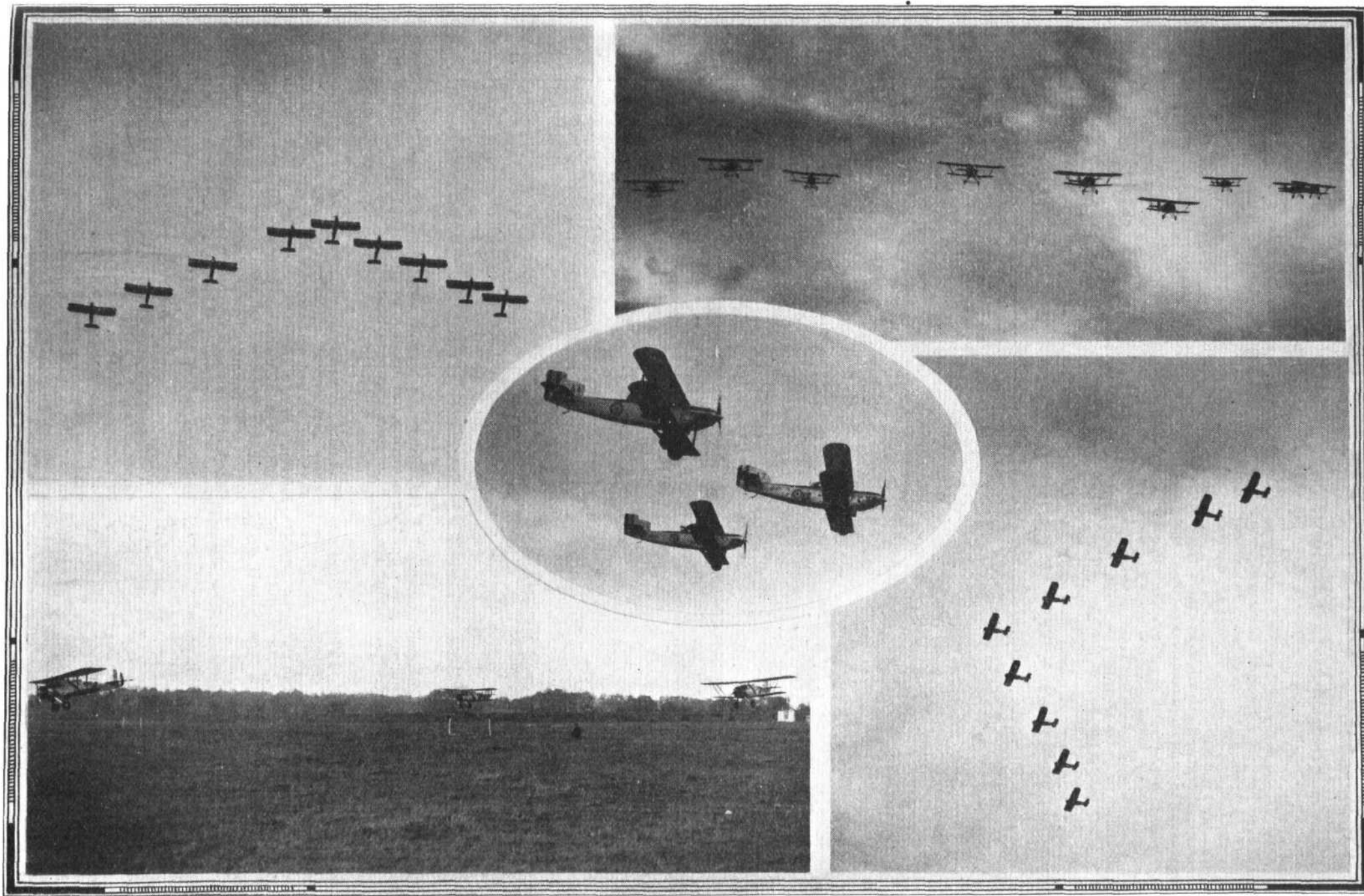
aerobatics. In a parade and fly past of different types of bombers there were Fairey "Fox," Fairey III, Hawker "Horsley," Vickers "Virginia" and Handley-Page "Hyderabad." The final item was a fly past of a fighter wing. The squadrons were Nos. 41, 32, 17 and 43. There was a programme of music during the display by the Band of the Royal Air Force, conducted by Flight-Lieut. J. Ames, M.B.E., Director of Music of the R.A.F. Towards the end a Fairey "Fox" day bomber nose dived, and the pilot, Flight-Lieut. W. E. Somervell, and his observer, Corporal Loud, both of 12 Squadron, R.A.F. Andover, were killed.

In the evening the Sultan of Muscat was the guest of the British Government at dinner at Claridge's. Sir Robert Holland was Chairman in the absence of Lord Birkenhead.



["FLIGHT" Photograph]

THE SULTAN OF MUSCAT AT HENDON: Our Eastern visitor watching the R.A.F. Display given in his honour at Hendon Aerodrome on October 11. The group includes (from left to right) Group Capt. R. Peel Ross, Air Vice-Marshal F. R. Scarlett; Air Vice-Marshal Sir R. Brooke-Popham, Mr. Bertram Thomas and Air Vice-Marshal Sir J. Higgins.



THE R.A.F. DISPLAY FOR A SULTAN : On October 11 the R.A.F. gave a Display at Hendon in honour of the Sultan of Muscat. Our illustrations show—(top, left) No. 207 Bombing Squadron in close formation; and (right) No. 29 Fighter Squadron at Drill. On the left (bottom), No. 26 Squadron at "Message Picking Up"; and right, another view of No. 29 Squadron. Centre, three Fairey Day Bombers, of No. 207, "Fly Past."

GRAF ZEPPELIN'S ATLANTIC VOYAGE

Friedrichshaven-Lakehurst, N.J., in 4 Days 15 Hrs.

LEAVING her base at Friedrichshafen, Germany, at 7.50 a.m. (G.M.T.) on October 11, the new *Graf Zeppelin*, commanded by Dr. Hugo Eckener, flew the Atlantic to Lakehurst, New Jersey, in 111 hrs. 35 mins., or 4 days 15 hrs. She landed at Lakehurst at 10.33 p.m. (G.M.T.) on October 15, having covered approximately 5,000 miles.

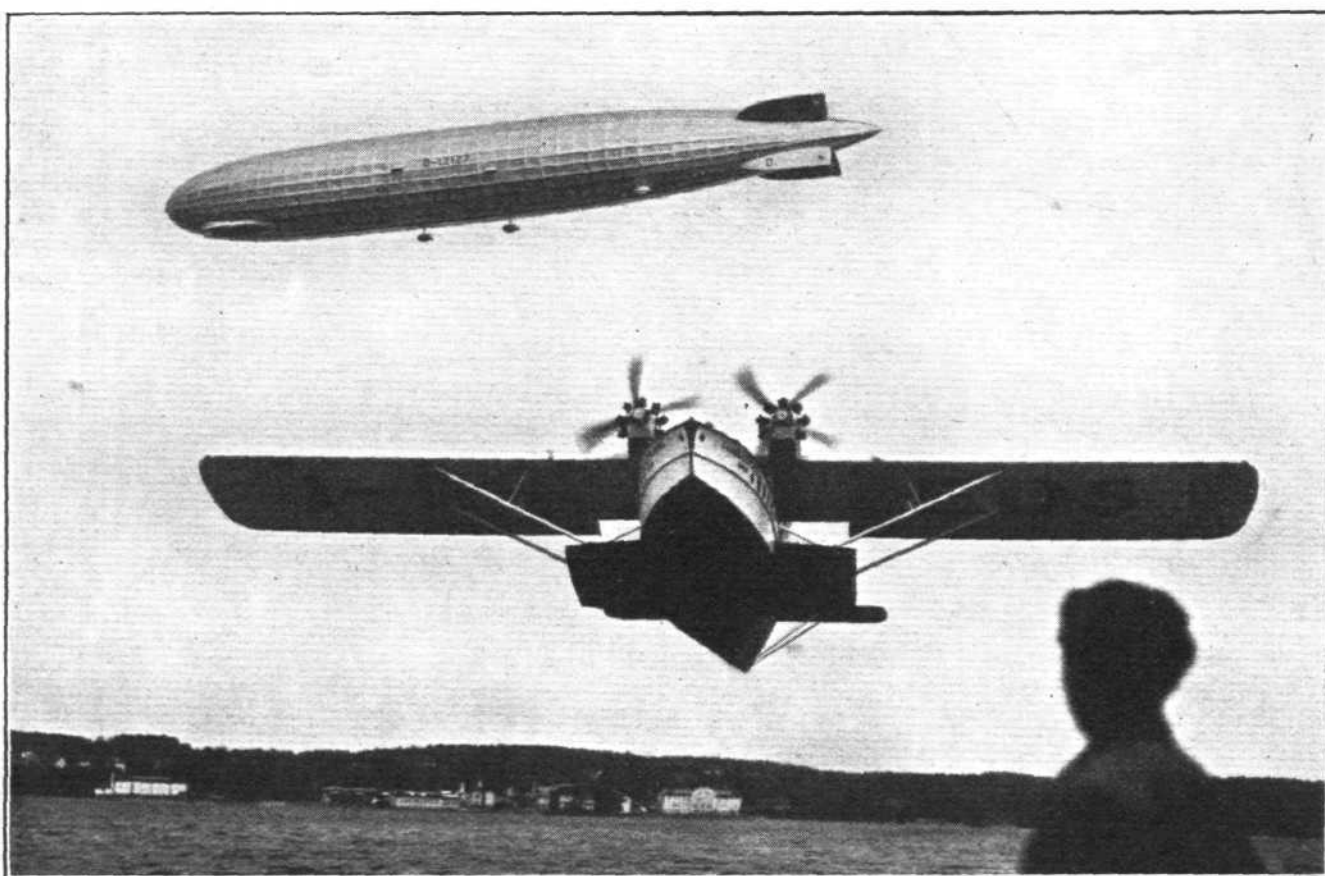
Before the start last Thursday the weather over the Atlantic was very unfavourable, and Commander Rosendahl, the American commander of the *Los Angeles* airship, was inclined to be against a start, but Dr. Eckener felt confident and the ship then left, passing quickly from view over Lake Constance. The immediate course was to the south of France to avoid the bad weather in the Bay of Biscay. She was sighted over Belfort, Lyons and Montelimar during the day, and by 3.30 p.m. passed Marseilles in conditions extremely favourable. French military aeroplanes escorted

the weather was better than expected, for it had been thought advisable to steer a straight southerly course towards the Bermudas. At 10.30 the Zeppelin sent out wireless messages again, chiefly to ships, and Gibraltar, as the atmospheric conditions created difficulties in communicating with the German coastal station at Norddeich.

Port Horizontal Fin Damaged

The Washington Navy Department was asked for weather reports at the Azores and Bermuda. This message was picked up by the British steamer *Windsor Castle*, relayed to Portishead and thus passed on to Washington.

When 1,100 miles east of Bermuda and 1,500 miles east of Charleston, South Carolina, the port horizontal fin was damaged and the speed of the airship reduced to 40 m.p.h. Repairs were completed, and the speed was then given as



"GRAF ZEPPELIN": The new Zeppelin airship L.Z.127, which has just accomplished a record flight from Germany to Lakehurst, N.J., flying over Lake Constance during her trials. In the foreground is a Dornier "Super-Wal" (four Bristol "Jupiters") flying boat.

the airship part of the way over France. At 7 p.m. Barcelona was reached. A wireless message was received at Friedrichshafen indicating that the course was set for the African coast owing to storms on the Spanish coast and the ocean crossing was anticipated to commence at 2 a.m. The original course planned was *via* the Azores direct, but these islands were eventually reached from the south-east.

Ocean Crossing

After leaving Barcelona the Zeppelin passed Gibraltar and wirelessly this position to the wireless station at Casablanca, having been flying for 21 hrs. Flying west-south-west she started across the ocean and was sighted by the British steamer *Cymric* when about 190 miles south of Cape St. Vincent. By the afternoon the island of Madeira was passed, and when west of the island she was sighted by another steamer flying in fair weather. Over Funchal a mail bag was dropped for the German Consul there. The speed of the ship was 85 m.p.h. On a north-west course, she passed the Azores 30 miles south at 8 p.m. Friday. Rain and cloud prevailed at the time. This northerly course suggested that

55 m.p.h. This damage was considered due to a sudden vertical gust of wind. Weather was rough at the time. The Navy Department next received a message from the airship informing them of the defect, also requesting that a ship in the vicinity should follow her course. All light cruisers at Hampton Roads and a squadron of destroyers at Charleston, South Carolina, were ordered to be ready to leave immediately should need arise. This happened on Saturday, and still the arrival of the airship at Lakehurst was expected on Sunday by the commander, Dr. Eckener.

Slow Progress

The Zeppelin was reported over Bermuda at 12 midnight on Saturday, and by 1 p.m. on Sunday her position was only 80 miles further towards the goal. She was burning red and green flares when seen from Bermuda, and the north-east wind had dropped considerably. It took from 12 midnight on Saturday until 3.10 p.m. on Monday for the airship to fly the 500 miles from Bermuda to the coast of America at a point 6 miles north of Cape Charles, Virginia. At the moment of landfall she had been flying for 104 hours. The landing

officials at Lakehurst became concerned because their repeated requests by wireless to the *Graf Zeppelin* for her position and projected arrival were unanswered. Finally, the ship informed them that she was too busy sending press messages to give the information required. Dr. Eckener asked permission to fly over Washington and did so earlier than expected owing to the advantage of a 20 m.p.h. tail wind. From the streets the exposed framework where the port fin had been damaged could be seen, covering a length of nearly 20 ft. Steering north-east, the Zeppelin passed Baltimore, Elkton, Maryland and Philadelphia, which is 40 miles from Lakehurst and about 100 miles from New York. Soon New York was gazing up at the ship and sent up various expressions of welcome. The sky could be seen through the skeleton of the fin. Aeroplanes flew all round her. When she was over Washington President Coolidge sent a congratulatory message to President von Hindenburg. He had also received one himself from Dr. Eckener, which had been replied to as follows:—"It gives me great pleasure to congratulate you upon the success of your voyage from Germany and to assure you that your arrival

is welcome as a symbol of the advance in air transportation which has been so ably furthered by your own efforts and those of your compatriots."

Enormous crowds awaited the landing at Lakehurst. At 10.30 p.m. the Zeppelin was over the mooring mast and was housed alongside the *Los Angeles*, the other German airship, which was originally called the ZR3, flown to America by Dr. Eckener in 1924. The arrival of the Zeppelin was relayed to Europe and the drone of the engines was clearly heard in England, although atmospherics prevailed.

Personnel and General Statistics

There were 20 passengers and a crew of 40 on board. Dr. Eckener's officers in the navigating room were Captains Lehmann, Fleming and von Schiller, all of whom accompanied him on the flight in ZR3 in 1924. Lady Drummond Hay was the only English passenger. Representing Spain was Colonel Herrera, an airship expert. There were also representatives of the Reich and Prussian Governments, and

(Concluded on page 928)

THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

The Committee of the Royal Aero Club met on October 10, 1928, Lieut.-Col. Sir Francis K. McClean, A.F.C., presiding.

Election of Members.—The following new members were elected:—

Flying-Officer Alexander Kelway Bamber; Hugh Finlay Dempster; John Charles Douglas; Arthur Harrison-Hall; Andrew Paton Holt; Charles Archibald Edward Ivor Lees; Eric Thorne Symmons.

Honorary Membership.—Lieut.-Com. W. D. Thomas, U.S. Naval Air Attaché.

Australian Aero Club.—The affiliation of the Australian Aero Club to the Royal Aero Club was approved.

F.A.I. Carnet for Air Touring.—The following fees were approved: Aircraft value up to £1,000, £1 5s.; Aircraft value over £1,000, £1 11s. 6d.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

8390	James Reynolds Guthrie	..	Midland A.C.
8391	Edward Henry Thierry	..	London A.C.
8392	George Groner	..	Henderson Flying School.
8393	Robert Skirving Pirie	..	Surrey Flying Services.
8394*	Arthur von Briesen Menken	..	De Havilland Flying School.
8395	Cyril Bonnicksen	..	London A.C.
8396	John Evelyn Croslyn McClure	..	Liverpool & District A.C.
8397	Cecil Ray Pender Curtis-Nut-hall	..	Hampshire A.C.
8398	John William Pender Chalmers	..	London A.C.
8399	John Langton Courtenay Banks	..	Henderson Flying School.
8400	Hugh Charles Bergel	..	London A.C.
8401	John Moore Gittins	..	De Havilland Flying School.
8402	Harold Edward Sturge	..	Hampshire A.C.
8403	Alexander Fyfe Burns	..	London A.C.
8404	Glencairn Sholto Ogilvie	..	Suffolk & Eastern Counties A.C.
8405	Eleanor Isabella Slade	..	Newcastle-upon-Tyne A.C.
8406	Morley Kennerley	..	De Havilland Flying School.
8407	Roland Babington Laidlaw	..	Midland A.C.
8408	Percy Edward Lovell Gethin	..	De Havilland Flying School.
8409	Douglas Henry Corsellis	..	Norfolk & Norwich A.C.
8410	William Kennedy Lean	..	Scottish Flying Club.
8411	Sydney James Taylor	..	Surrey Flying Services.
8412	Eric Birch Glenn	..	Nottingham A.C.
8413	Michael Aidan Murtagh	..	Midland A.C.
8414	George Frederick Boyle	..	De Havilland Flying School.
8415	Herbert Sutton	..	London A.C.
8416	Penryn Victor Monk Goldman	..	Hampshire A.C.
8417	Derick Heathcoat Amory	..	Bristol & Wessex A.C.

8418	Robert Young Dickson	..	Scottish Flying Club.
8419	John Augustus Victor Cook	..	Midland A.C.
8420	Debabrata Chakraverti	..	De Havilland Flying School.
8421	Petrus Johannus Hubertus Philippus Dujardin	..	Yorkshire A.C.
8422	Alec Knowles Fitton	..	Yorkshire A.C.
8423	Edward Leicester Hulme	..	Midland A.C.
8424	Harold Basset Collins	..	Suffolk & Eastern Counties A.C.
8425	Burton Lester	..	Lancashire School of Aviation.
8426	William Hart	..	London A.C.
8427	James Valentine Fairbairn	..	London A.C.
8428	Douglas Lippiatt Doyle	..	Surrey Flying Services.
8429	Alfred Edmund Clayton Tennyson d'Eyncourt	..	Henderson Flying School.
8430	Alan Dower Blumlein	..	London A.C.
8431	Ernest Arthur Lingard	..	London A.C.
8432	Donald James Hamilton-Lister	..	Surrey Flying Services.
8433	Thomas Elder Hearn	..	London A.C.
8434	Mary Hicks	..	London A.C.

Early Flights.—Capt. G. de Havilland has accepted the invitation of the Royal Aero Club to serve on this Committee. The Committee consists of Lord Gorell, Capt. G. de Havilland and Lieut.-Col. W. Lockwood Marsh, and will commence its investigations in November.

The Late Major von Tschudi.—The news of the death of Major von Tschudi, the Secretary of the Deutscher Luftrat, Berlin, on October 8, was received with deep regret, and a message of condolence was sent to the Deutscher Luftrat. The Royal Aero Club was represented at the funeral by Colonel The Master of Sempill and Group-Capt. M. G. Christie, C.M.G., D.S.O., M.C.

ASSOCIATED CLUBS' GENERAL COUNCIL

Bristol and Wessex Aeroplane Club, Felixstowe Light Aeroplane Club, Halton Aero Club, Hampshire Aeroplane Club, Lancashire Aero Club, London Aeroplane Club, Midland Aero Club, Newcastle-on-Tyne Aero Club, Norfolk and Norwich Aero Club, Nottingham Aero Club, Royal Aircraft Establishment Aero Club, Suffolk and Eastern Counties Aeroplane Club, Yorkshire Aeroplane Club.

A meeting of the General Council of Associated Clubs will be held at the Royal Aero Club, 3, Clifford Street, London, W.1. on Friday, November 2, 1928, at 11 a.m.

Amongst the subjects official for discussion are insurance, future policy regarding Official Race Meetings, and the programme of Official Meetings for 1929.

In connection with the pooling arrangements of the Official Meetings in 1928, the Bristol and Blackpool Meetings both showed a surplus and the General Council will decide on the distribution amongst the Associated Clubs.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

THE U.S. NATIONAL AIR RACES AND AERO SHOW

A Canadian Correspondent's Impressions

THE De Havilland Aircraft Co. and its Canadian branch have every reason to be proud of the showing made by the D.H. "Moth" at the recent U.S. National Air Races. There were two "Moths" at this big Aviation event, one entered in the Class A transcontinental flight, and one in the international race from Windsor.

The first, GCAX, entered by John E. Carberry, of Toronto, was eighteenth among the 22 planes which finished. It was generally considered that the "Moth," the lightest-powered plane in the race, would not survive, but it did, finishing in

aeronautical exposition held at Los Angeles, September 8 to 16, in conjunction with the U.S. National Air Races was quite representative of the industry in America, and therefore quite an imposing show. The exposition building, containing 200,000 sq. ft. of floor space, was of stucco construction, with nothing but coloured bunting for a roof—so great is the Californian's faith in his sunshine. That faith was justified, too, for not once during the meet did the weather man even frown.

The centre section of the exposition building was devoted

U.S. National Air Races: A "Waco Ten," of which several were entered for the various events. It was one of these machines, piloted by W. H. E. Drury (a native of St. Catharines, Ont.), and fitted with a Wright "Whirlwind" that won the International Trans-Continental Race.



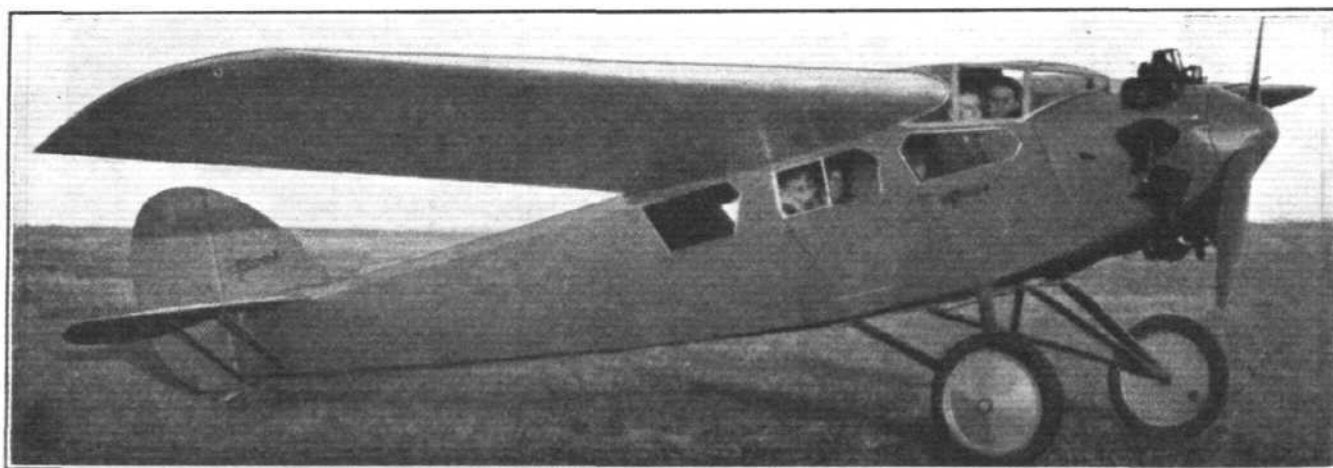
good shape. Carberry said that his chief trouble was caused by delays for tyre repairs.

The other "Moth," entered by K. E. Whyte and H. R. Campbell, of the Hamilton Aero Club, was second in the international race, being beaten by a Whirlwind Waco—220 h.p. against 80.

Carberry's "Moth" created quite a sensation by trimming all the U.S. light airplanes—the Heath monoplane (Bristol Cherub), several Monocoupes (Velie), a Mohawk (Velie), a Flying Dutchman, and others—in the efficiency test. The

to aircraft, either complete or partially assembled, while the 200 odd booths on the side and ends were assigned to the display of motors and accessories.

By actual count, one found 36 different types of aircraft there, including one navy Vought Corsair, one Army Douglas observation plane, and two machines shown for their historical interest—a Hanriot Clerget, said to have been flown by Chas. Nungesser during the war, and the "Woolaroc" Travel Air, in which Goebel and Davis won the Dole prize flight to Honolulu.



U.S. NATIONAL AIR RACES: The "Cessna" (110 h.p. Warner "Scarab") monoplane which, piloted by Earl Rowland, won the Class A Trans-Continental Race (New York-Los Angeles).

Heath monoplane, a special racing machine with a 12-ft. wing spread and a fuselage barely large enough to hold one person, was first in the speed test, averaging 112 m.p.h., with a Monocoupe second at 97 m.p.h., and the "Moth" third, at 95.14 m.p.h. The Heath carried a useful load of only 70 lbs., however, the Monocoupe 400, and the Moth nearly 600. Thus the "Moth" was weeks ahead of the others in efficiency, which was determined by speed \times load divided by one-quarter of displacement.

The Exposition.—Although several leading manufacturers of aeroplanes and aircraft accessories did not exhibit, the

Of the commercial aircraft, 18 were open type and 13 cabin jobs. Twenty-seven were single motor craft, and five tri-motor. The cabin machines included only two biplanes, the new Boeing 12-passenger transport, and the Boeing four-place mail plane. The five tri-motor jobs were the new Boeing 80, a Western Air Express Fokker, a Maddux Air Line all-metal Ford, a Bach eight-place air yacht, and a new three-place open ship called the Kreutzer. The last-named is a monoplane built by Jos. Kreutzer Corp., of Los Angeles. It is powered with three Hallett seven-cylinder radials.

Popularity of the air-cooled motor was indicated by the

fact that 22 of the planes were equipped with radials, and only nine with water-cooled power plants. Of the 18 motors shown in the various booths, 16 were air-cooled, and two V in line 12-cylinder plants.

There was a noticeable tendency towards "sport" models in the open planes, and many of the newer designs of well-known makers, such as Eaglerock, Waco, etc., showed remarkably clean lines. Needless to say, there were a large number of monoplanes, even among the machines designed for light commercial or private use.

Two firms which have been building service craft exclusively—Keystone and Douglas—announced their entry to the commercial field. The former announced the "Patrician," a 20-passenger tri-motor plane, of which only a model was available. Douglas showed a new three-phase open plane, the "Ambassador."

The Races.—As for the races themselves, they were spread a little too thin over the nine-day period. If all the events had been run off in five days instead of nine the public would have had a chance to get its money's worth and everyone would have been happy except, perhaps, the California Air Race Association which sponsored the meet. It spent \$300,000 in preparation for the affair, including some \$100,000 for laying out a field nearly 800 acres in extent providing four large runways. Naturally it was anxious to get its money back.

As it was, however, the daily exhibitions of formation

in a series (generally five or six) loops. They formed a regular "squirrel cage" in the air.

The "Three Musketeers" gave almost as good a display, diving, looping and rolling in the convention Vee, and then "stacking" their planes one above the other. On one occasion two of the "Musketeers," Lieut. Cornelius and Woodring, climbed to 5000 ft. and did a three-quarter outside loop. During this display the third member of the group amused the crowd with stunts at 200 ft., and so met his death. The carburettor of his motor was not fixed for inverted flight and it cut out just as he was rolling out of his upside down position. He crashed, nose buried in the field, and died next day.

Thereafter Col. Chas. A. Lindbergh who trained with the "Three Musketeers" at Rockwell Field some years ago led the formation. His flying on the first day was a bit wobbly, but he soon got his hand in. There was no more inverted flying by the Army planes, however, though the "Sea Hawks" whose carburettors had been fixed, continued their daily upside-down exhibitions.

For the rest, the Navy squadron VB2B of the carrier *Saratoga* now on the Pacific, gave several splendid 15-ship demonstrations. In one of their displays nine ships looped in formation. The bombers laid smoke screens, the marine corps did some night formation flying, and the 91st observation did some very close formation work. At the end of the meet there was the usual blowing up of the miniature



U.S. NATIONAL AIR RACES: The D.H. "Moth," flown by its owners, Kenneth E. Whyte and Harry R. Campbell (Members of the Hamilton, Ont., Aero Club), in the International Trans-Continental Air Race (Windsor-Los Angeles). They came in second.

flying and aerial drill by U.S. army and navy pilots made up a large portion of the programme. One had to sit through several days of the same fare in order to see three or four civilian races.

The daily display given by U.S. Army, Navy, and Marine pilots showed that they have not yet reached the proficiency attained by the Royal Air Force. Yet their flying was well done in most cases.

Each day, in addition to aerial drill by either Navy, Army or Marine units, there was an exhibition of stunting in formation by the Navy's "Three Sea Hawks" (Lieuts. Tomlinson, Davis and Storrs) of the first fighting squadron and by the Army's "Three Musketeers" (Lieuts. J. J. Williams, W. L. Cornelius, and I. A. Woodring), from Rockwell Field.

The "Sea Hawks," flying Boeing single-seater fighters, did banks, loops, rolls and Immelman turns in perfect Vee formation. Their display was outstanding. In their dives, banks and loops, the wing tips of Nos. 2 and 3 were seldom more than 6 ft. from the tail of the leading machine. In their rolls and Immelmans they were not quite so close, of course, but even in these manoeuvres they kept their places perfectly.

One of their stunts was to spread the Vee as they approached the grandstand where Tomlinson, the leader, would roll over, flying the length of the field upside down. Later they all rolled over and flew the Vee while inverted. They also did a "ring around arosy" in which they followed one another

village by the Navy and of a captive balloon by the Army. There were also daily exhibitions of parachute jumping.

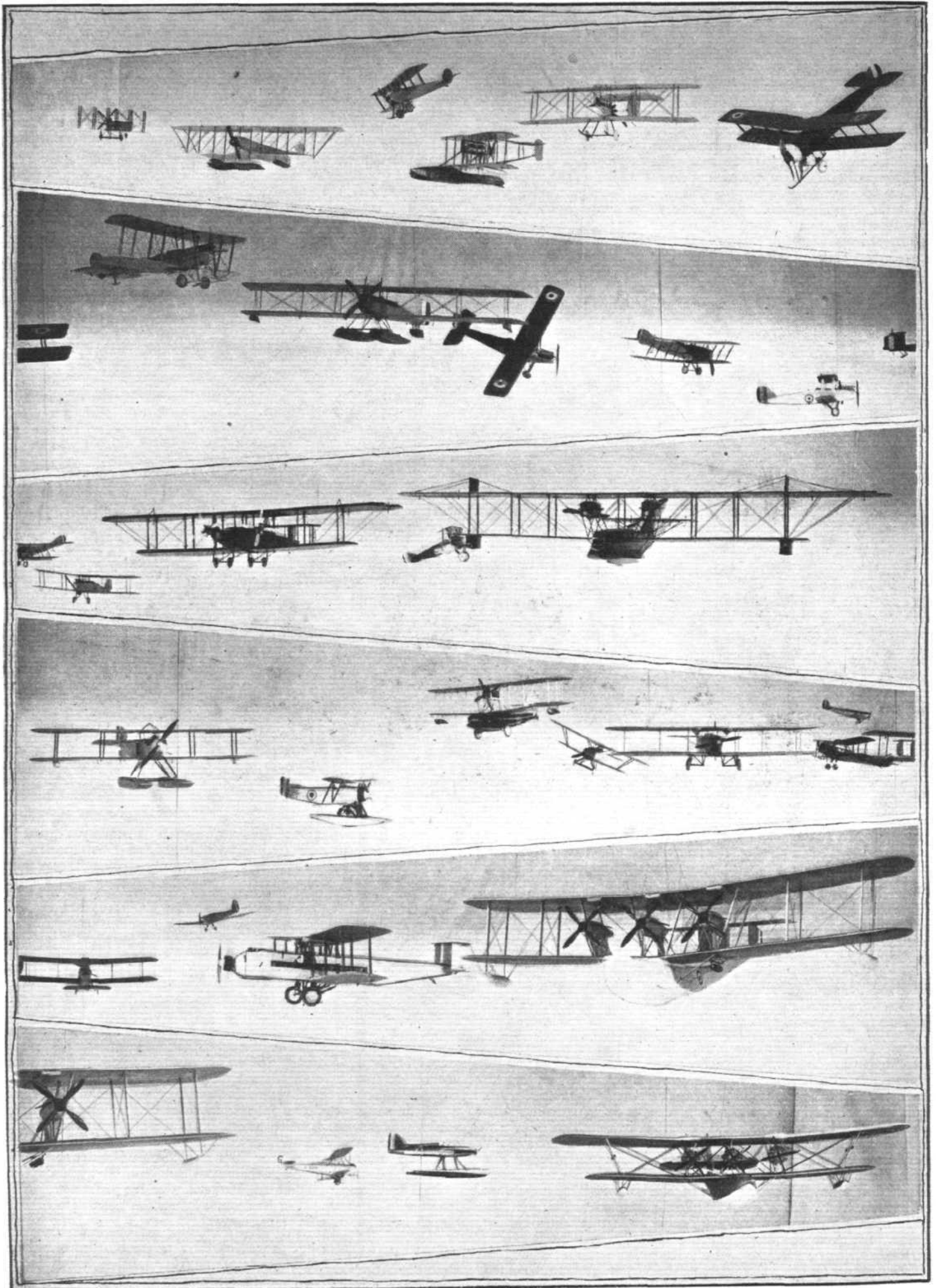
In the service races over the closed course, there was nothing of unusual nature. In a free-for-all military pursuit race, a new Boeing single-seater fighter, which recently underwent its acceptance tests but which is not yet in production, averaged 180.2 m.p.h. for 60 miles.

Civilian Races.—In addition to the four trans-continental races there was an international race for Canadian pilots from Windsor, Ont., to Los Angeles, 2,145 miles, two cross-country races from San Francisco, and a number of closed course events.

None of the seven starters finished in the trans-continental non-stop race, all being forced down either by the weather, which was very bad, or by shortage of fuel. Art Goebel and Harry Tucker, in their Lockheed Vega with a Pratt and Whitney Wasp, landed for fuel at Prescott, Arizona, only 2 hours' air-time distance from Los Angeles.

Earl Rowland of Wichita, Kansas, was first in class "A" (motors of 510 cub. in. or less) completing the 2,939 miles with its 15 controls (11 30-min. day stops and five night stops) in 24 hrs. 31 secs. He flew a Cessna monoplane powered with a Warner 110 h.p. Scarab. It is interesting to note that the first four to finish in this class were powered with Scarabs. Twenty-two of the 31 planes which started from New York arrived safely, including John E. Carberry of Toronto, in his D.H. "Moth" with its 80 h.p. "Cirrus."

(Concluded on p. 926.)



DEVELOPMENT OF BRITISH AVIATION SHOWN BY MODELS: The series of scale models shown by the Air Ministry and Royal Aeronautical Society at Berlin is very complete and representative.



(Continued from page 890.)

In our issue of last week we gave very briefly a list of the aircraft exhibited at the Berlin Aero Show. Neither time nor space permitted of anything like a detailed description of the sixty or so machines shown, but we were able to inform our readers of what there is to be seen at the I.L.A., and to illustrate by photographs some of the more interesting types.

It is now possible to sit down, so to speak, to a more leisured contemplation of the various machines, and in the present issue of *FLIGHT* we have adopted the plan of grouping the machines according to class, believing that in this way a comparison, where such is possible, will be facilitated, and readers interested in one particular class of machine may the more readily find the data relating to it.

FLYING-BOATS AT THE SHOW

As we pointed out in last week's issue, it was regrettable that it was not found possible to exhibit one of the modern British flying-boats at Berlin. Great Britain has made very great strides indeed in the design and construction of multi-engined flying-boats, and their absence from the show meant that the two famous German constructors, Dornier and Rohrbach, had it all to themselves in the matter of large flying-boats. A comparison with one or two modern British examples would have been extremely interesting, as Dornier and Rohrbach, working quite independently, have each evolved a type of design differing in almost every respect not only from British practice but from each other. Which type is likely to survive, or whether the types are so nearly equal that the future will see all three types employed side by side, time alone can show. That the two German designs mentioned differ materially from British boats was descriptively expressed by one British visitor to the Show, who said, "Either we

are wrong or they are." Certainly, it is difficult for one accustomed to the lines of a British flying-boat to see the merits in the German. That they do have merits one does not presume to doubt, and in the following notes we will try to discover these, even if the effect of the unaccustomed should render the process both difficult and of somewhat doubtful value.

The Dornier Flying-Boats

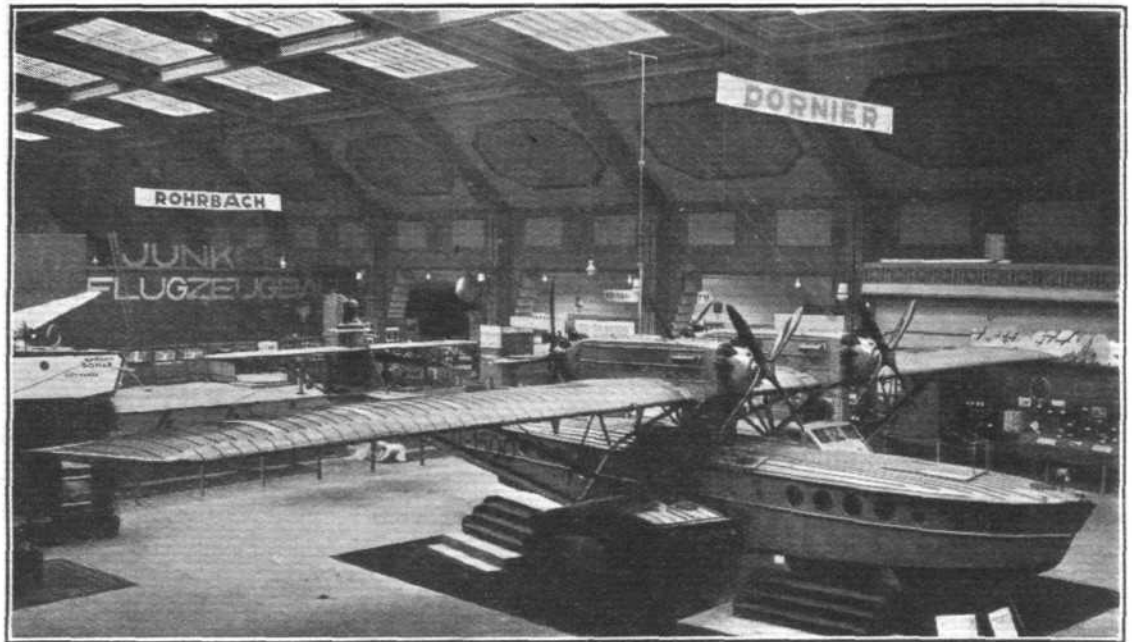
By the reading of his paper before the Royal Aeronautical Society some months ago, Herr Dr. C. Dornier gave a much better explanation of his distinctive design than the present writer could possibly do, and moreover, he illustrated by the facts and figures then given that he had found a system of construction and design in which the percentage structure weight does not increase as rapidly with size as we in England should expect. At Berlin, Herr Dornier is not exhibiting the "Super Super Wal," but merely the "Super Wal" four-engined machine, the general appearance of which is already familiar to *FLIGHT* readers, and, in the open between Hall II and Hall III, a "Delphin III" single-engined seaplane which is, strictly speaking, neither flying-boat nor float seaplane, but falls between the two types. In addition to the two machines, the Dornier exhibit includes a large number of very fine scale models, specimens of structural members and test-pieces, and photographs.

The "Super Wal" is a four-engined monoplane flying-boat, with the engines arranged in tandem pairs on top of the wing. Metal construction is employed throughout, even to the wing covering. In the machine exhibited the engines are Gnome-Rhone "Jupiters," but the type has also been produced and flown with great success fitted with four Napier "Lions."



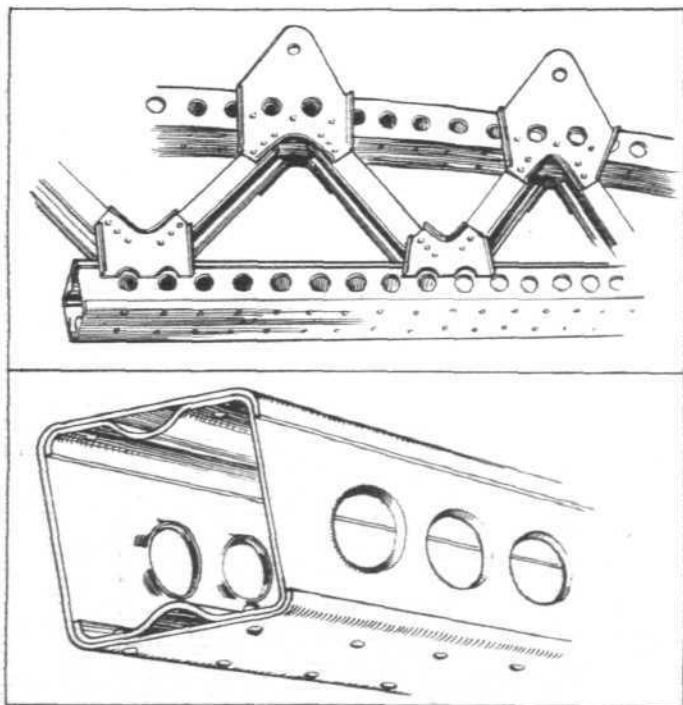
A VERY EFFECTIVE STAND: The Armstrong-Siddeley range of radial air-cooled engines is well displayed at the Berlin Show.

The Dornier
"Super-Wal":
The power plant
consists of four
"Jupiters."



The boat hull is of the flat-sided type, and shows a perfectly straight sheer line. There is a slight Vee bottom ahead of the step, but far less pronounced than that found on all modern British flying-boats. Aft of the step, which is located farther aft than is the main step in British flying-boats, the main hull bottom slopes up to the sternpost, and built on to it is a form of rear step which is not, however, of the same but of far smaller beam than the main hull at this point. This second step, or keel, terminates at the rear in a vertical knife edge, to which is hinged a water rudder. Lateral stability is obtained by wing stumps growing out of the

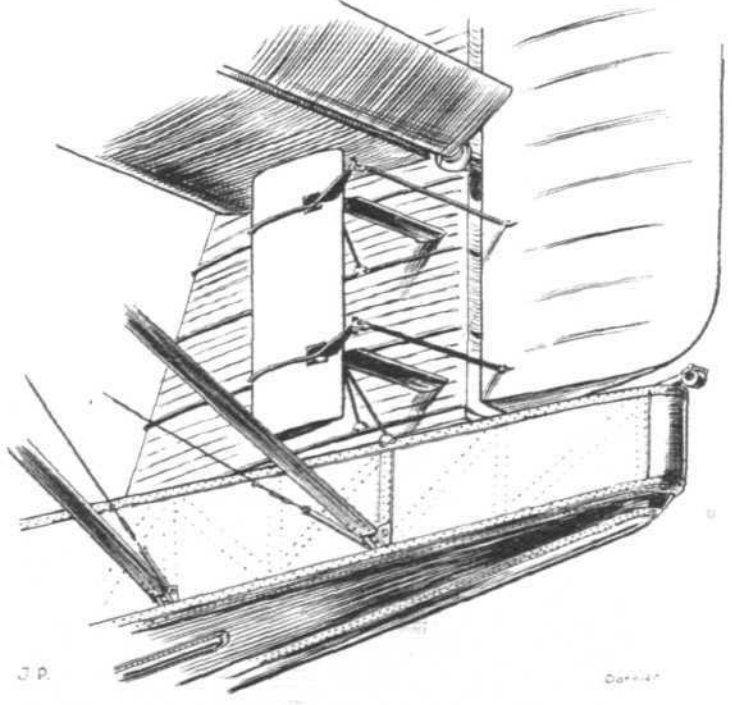
chosen in any haphazard manner. The boat deck is but slightly cambered, so that it is possible, when the machine is on the water, to walk about "on deck" in comfort. The shape of the whole hull is more like that of a modern high-speed motor boat, and has many advantages for handling on the water. How the drag coefficient compares with that of representative British flying-boat hulls we have no means of knowing, but in view of the much more nearly stream-line form of our boats, even to the fairing-in of the steps, it seems likely that the Dornier type of hull must have a greater drag coefficient than ours.



["FLIGHT" Sketches

THE DORNIER "SUPER WAL" : Sketches showing forms of Dornier metal wing-spar construction.

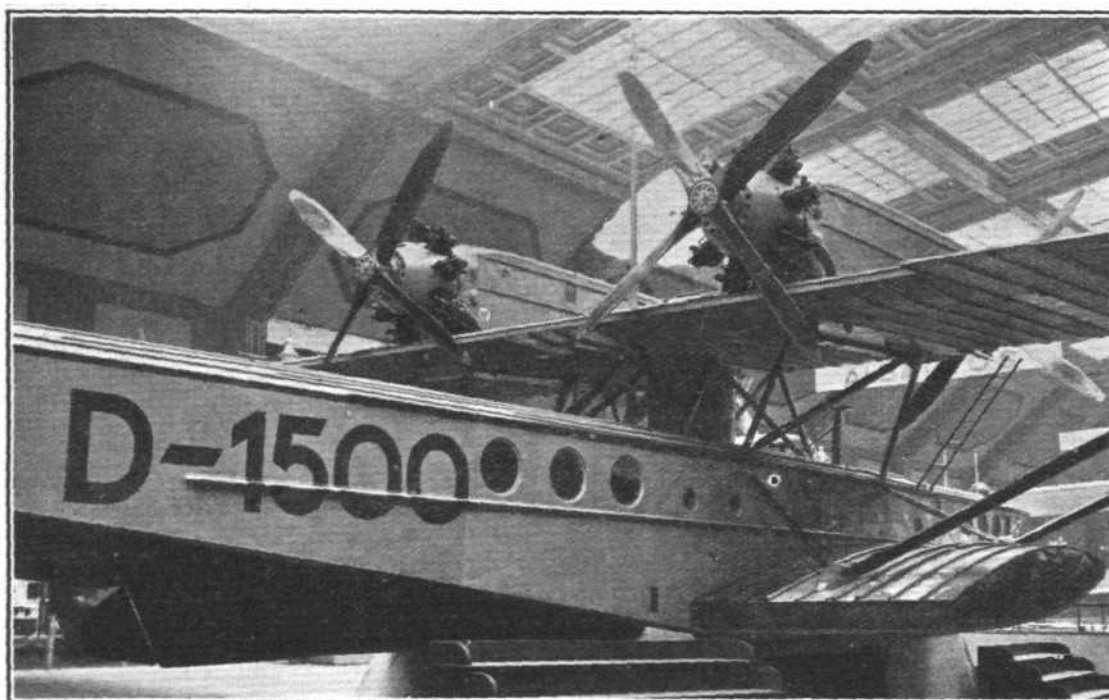
sides of the hull. Exactly how porpoising is avoided with such an arrangement of steps is not clear, but films of the machine taking off indicate no tendency to porpoise, so that presumably this vice can be successfully cured by other means than those generally employed in England. It is to be supposed that the aft step or keel structure serves to reduce the shock on alighting, as the relatively flat vee of the main hull bottom would not appear to English eyes capable of doing so in anything of a rough sea. The Dornier firm has had carried out a very large number of tank tests on models, and it is not likely that the present form has been



["FLIGHT" Sketch

AN UNUSUAL FORM OF RUDDER BALANCE : On the Dornier "Super-Wal" separate surfaces, unstably hinged, are made to facilitate the work of operating the rudder.

Whether the wing stump type of side float is better or worse than the separate wing float is open to discussion. Set as the wing stumps are in the Dornier machines at a large angle of incidence (necessitated by considerations of water performance), one would expect them to carry a considerable amount of weight, and while they may, as is sometimes claimed for them (although we have not seen the claim made by Herr Dornier himself), "carry their own weight" in flight, the induced drag must be fairly great in view of the



The Dornier Super-Wal "Blauwal": This photograph shows the cowl-ing of the aft en-gines, the shape of the wing-stump floats, and the narrow-beam aft step with water rudder.

short span. The streamline wing float, on the other hand, does not give any lift in return for its drag, but we imagine that the drag itself is probably smaller, partly because of the shape, and partly on account of the smaller volume which a farther outboard position makes possible.

As regards the internal equipment of the "Super Wal," this is very comfortable for the 19 passengers, the portholes being large and giving a reasonably well-lighted cabin. The actual cabin space is divided into two separate saloons by a smaller compartment, seating accommodation being provided for 11 passengers in the forward saloon and for eight in the aft saloon. The "Super Wal" is very fully provided with navigation and wireless equipment, and the hull contains, in addition to the two saloons, goods and luggage compartments, as well as a wireless and navigator's cabin. The pilots' cockpit is ahead of the wing, and has a "coach roof" over it for the protection of the occupants. The normal quantity of petrol carried is 3,800 litres (836 gallons), and the oil 300 litres (66 gallons).

The main dimensions and weights of the "Super Wal" are as follows:—Length overall, 24.6 m. (80.6 ft.); wing

span, 28.6 m. (93.8 ft.); wing area, 143.8 sq. m. (1,547 sq. ft.) Weight empty, 7,800 kg. (17,150 lb.); normal loaded weight, 12,600 kg. (27,700 lb.); wing loading, 17.9 lb./sq. ft.; power loading (on 2,000 h.p.), 13.88 lb./h.p.; maximum speed, 220 km./h. (136.5 m.p.h.); cruising speed, 180 km./h. (112 m.p.h.).

Exhibited in the open, between Halls II and III, is a Dornier Dolphin III with B.M.W. engine. Designed for use over fairly sheltered waters such as for coastwise flying or operating from inland lakes, this machine is, strictly speaking, neither flying-boat nor seaplane, but something in between the two types. A single flying-boat hull, of small size, has been built on to the floor of what may be regarded as a fairly orthodox aeroplane fuselage, and lateral stability on the water is obtained as in the large Dornier flying-boats, by wing stumps growing out of the sides of the hull. The monoplane wing is braced by struts as in the large flying-boats, and the engine is mounted high above the forward part of the fuselage so as to give clearance between the propeller tips and the forward deck of the hull.

The pilot is situated in a forward part of the cabin, where

The Dornier "Dolphin": De-veloped from the "Komet" type of landplane, this machine has a central hull added to a normal fuse-lage, but with an unusual engine placing.



The Rohrbach
 "Romar" flying
 boat has a hull of
 very narrow
 beam and
 negligible lateral
 stability on the
 water. The wing
 floats are large to
 make up for this.



large windows give him a good view forward and sideways, although upwards and downwards his view is entirely cut off by the engine housing and hull respectively. Constructionally the Dolphin III is based upon the same principles as those adopted in the large Dornier flying-boats.

The cabin has seating accommodation for 10 passengers, and the pilot's cockpit is equipped with dual controls, enabling two pilots to take turns at controlling the machine. The range of the Dolphin III is not as great as that of the Superwal, the petrol supply being normally 570 litres (125 gallons), and 60 litres of oil (13.2 gallons). The overall length of the Dolphin III is 14.35 metres (47.1 lbs.), and the wing span 19.6 m. (64.3 ft.). The weight empty is 2,650 kg. (5,830 lbs.), and the normal gross weight 3,700 kg. (8,140 lbs.). The maximum speed is 190 km. per hour (118 m.p.h.), and the cruising speed 150 km. per hour (93 m.p.h.).

The Rohrbach "Romar"

With its large dimensions and lines expressive of great strength, not to say brutality, the Rohrbach "Romar" is, perhaps, the most imposing machine in the whole of the Berlin show. We understand that three of these machines have been built, of which one is exhibited, while a second is at present undergoing flying tests at Trawemünde, where it is said to have beaten all existing records for flying-boats by getting a weight of 18.5 tons into the air.

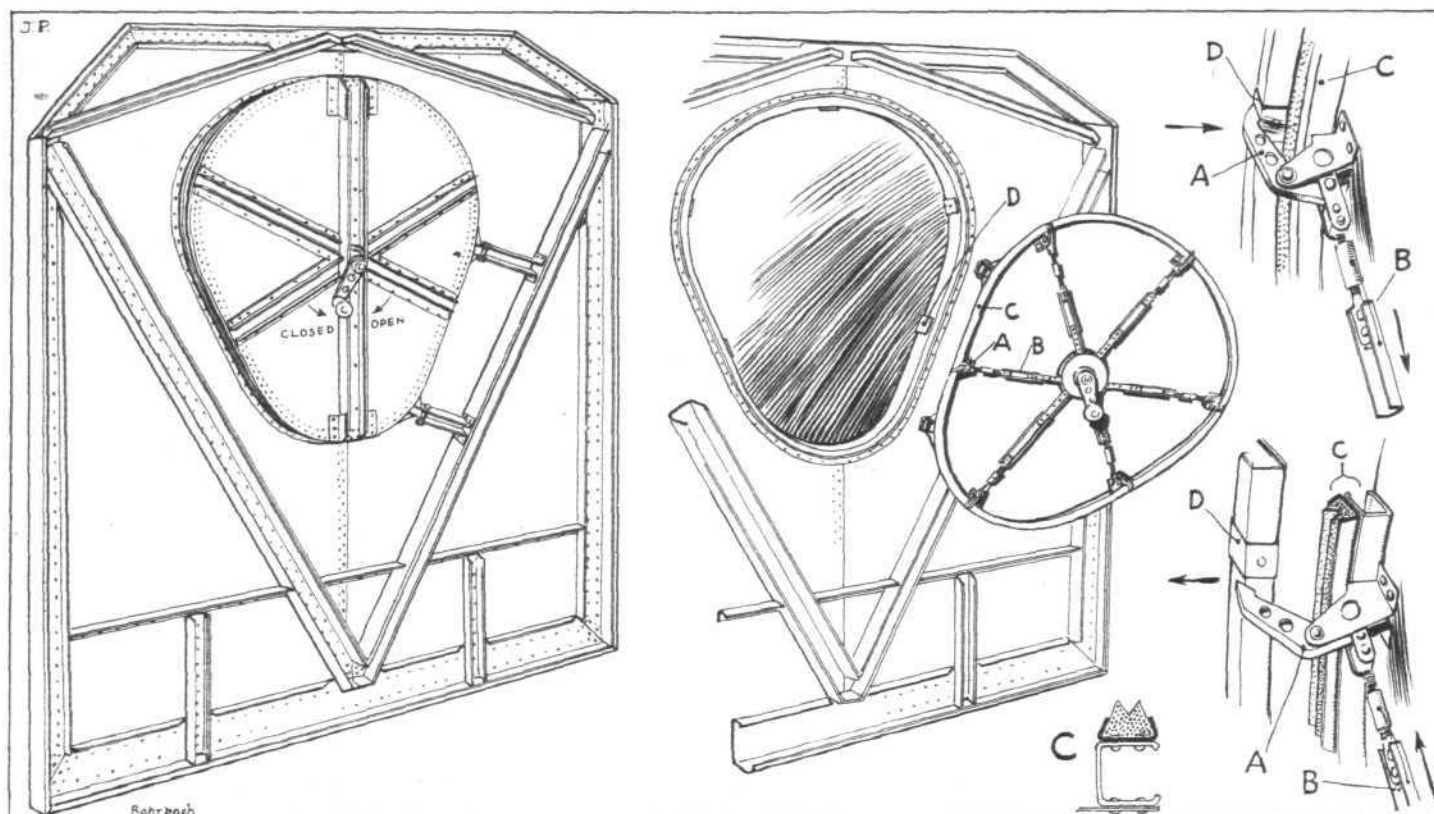
Generally speaking, the Romar resembles previous Rohrbach flying-boats, of which the Beardmore "Inverness" will

be one example known to FLIGHT readers. Modifications in design are, however, noticeable, such as, for instance, the very high placing of the engines, higher even than in previous types, and the pronounced taper of the monoplane wing, which is of tremendous chord and thickness at the root, but tapers to quite small chord and thickness at the tips.

The Rohrbach flying-boats have never been of very great beam, but in the Romar it would seem that Dr. Rohrbach has reached an irreducible minimum, and the hull of the machine resembles, as regards its length-to-beam ratio, the "plank on edge" type of yacht familiar to English yachtsmen forty or fifty years ago. The reduction of beam in the Romar has been accomplished by a change in the planing bottom from the flat bottom originally used by Rohrbach to one having a pronounced Vee. Moreover, the Vee is given a pronounced hollow, doubtless in order to reduce the shock on alighting, a feature probably connected also with the very narrow beam. It should be remembered that Dr. Rohrbach has, for many years, been the apostle of high wing loading, which is merely another way of saying that he has advocated high landing speeds. Whether one agrees with Dr. Rohrbach in this view or not—and there are those in this country who maintain that without a very high wing loading the Rohrbach machines would not be possible at all—the fact that the machine does have a high landing speed must, of necessity, call for a very careful design of hull in order to prevent the bottom from collapsing under the shock of alighting in the sea. An examination of the machine exhibited gives one the impression

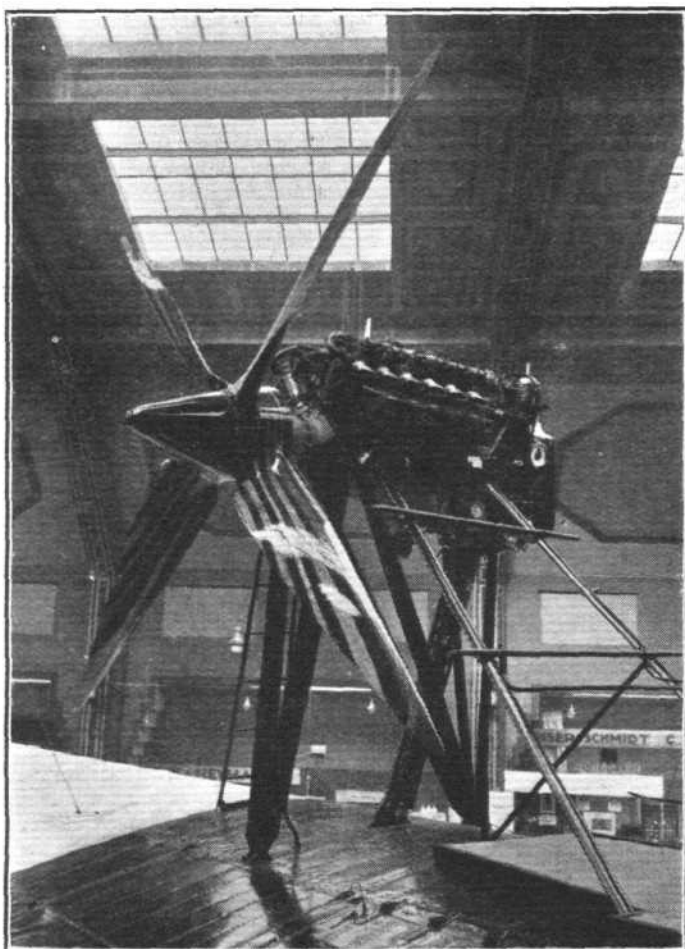


The A.D.C. Stand
 at Berlin: From
 left to right the
 engines are:
 Cirrus II, Nimbus
 and Cirrus III.

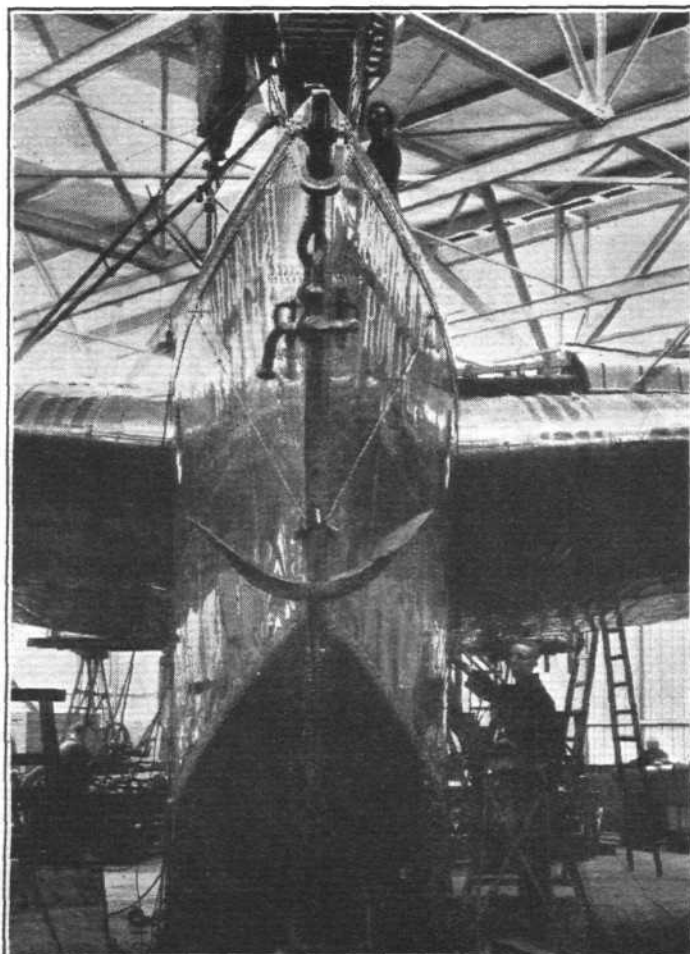


["FLIGHT" Sketches]

Water-tight bulkheads are used extensively on the Rohrbach "Romar." To facilitate inter-communication between compartments, doors of special design are used, which, although quickly opened, provide water-tight joints when closed. Details of the locking arrangements are shown, the central handle operating the radial members. The rubber strip shown at C is pressed against the metal frame, and in so doing expands and makes a tight joint.

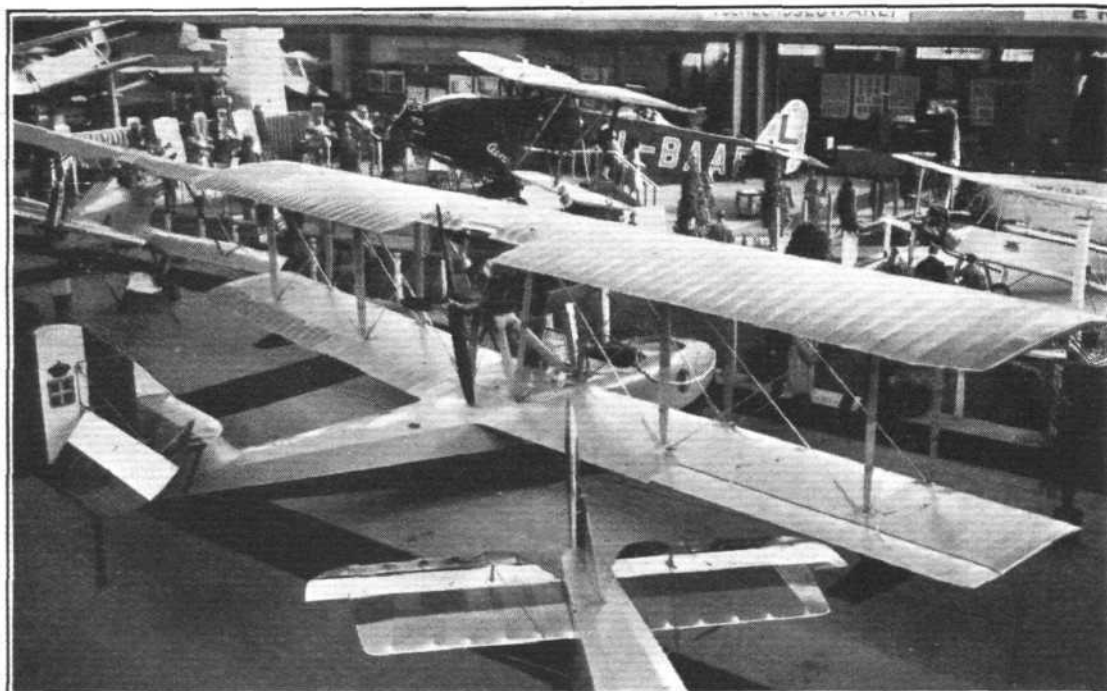


On the Rohrbach "Romar" the engines are mounted high above the wing on steel tube structures of rather "stilted" appearance.



NOT A CRUISER: This photograph showing the Rohrbach "Romar" hull from in front gives an excellent idea of the narrow beam. The bottom has a pronounced vee.

The Italian Flying-Boat: View from above of the Savoia S.59.



that Dr. Rohrbach argued that it would in any case be impossible to give the hull a beam sufficient for lateral stability on the water without the assistance of wing floats, and this being the case, it would be preferable for purposes of alighting to keep the beam down to the minimum necessary to enable the machine to "un-stick," and to rely upon the increased volume of the wing floats to make up for the lateral stability lost by reducing the beam of the main hull.

Another feature of the machine which forcibly impresses one is the relatively short tail leverage. The monoplane wing is of very great chord at the root, and the distance from main trailing edge to tail plane leading edge appears to be less than one chord length. The wing section employed does not appear to be one which would be likely to give a particularly small centre of pressure travel, and with the high position of the centre of thrust, which one would expect to cause a very considerable difference in trim between the "engine-on" and "engine-off" condition, the tail leverage looks to English eyes a good deal on the short side.

Constructionally, the Romar follows previous Rohrbach practice in that the wing is constructed of a main box spar very strongly built up from flat sheet and channel section, to the front and back of which are bolted the leading and trailing edges of the wing. The hull is flat-sided and flat-topped, the only portion which appears to require panel beating being the curved hollow planing bottom. As in previous Rohrbach

machines, Duralumin is the material used throughout, except for certain highly-stressed fittings and bolts, and certain struts such as those to the wing floats and those supporting the engines.

The hull is divided by bulkheads into watertight compartments, and some of them are provided with very ingenious bulkhead doors, which are opened almost as quickly as an ordinary door, but which yet make a watertight joint when closed. The details of one such door are shown in some of our sketches.

The extreme nose of the hull is used for stowage and is separated from the wireless compartment by a bulkhead door. In the aft wall of the wireless compartment is another bulkhead door communicating with the pilot's cockpit, which is totally enclosed. A feature of the Romar is that a special cockpit has been set aside for the engineer, in which are all the instruments, etc., relating to the power plant.

The passengers' cabin has seating accommodation for 12 passengers, and is divided by a bulkhead into two sections, of which the front cabin has four seats and the rear cabin eight.

The leading dimensions and weights of the Rohrbach Romar are as follows:—length, o.a., 22 m. (72.2 ft.); wing span, 36.9 m. (121 ft.); wing area, 170 sq. m. (1,830 sq. ft.); draught with normal load, 1.3 m. (4.26 ft.). The petrol tanks have a capacity of approximately 7,900 litres (1,740 gallons); and the oil tank capacity is 400 litres (88 gallons).

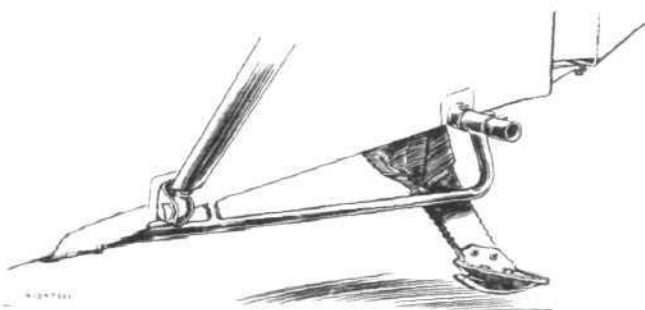


Not as Black as it is Painted: The Napier "Lion" nearly defeated the photographer, but its reputation is as bright as its colour was dark.



A Czech Commercial Machine:
The Aero A.23.

The crew consists of one navigator, one pilot, one wireless operator and one engineer, and the pay-load is 12 passengers with their luggage. The total loaded weight is approximately 19,000 kg. (41,800 lbs.), with which load the range is stated to be approximately 4,000 km. (2,480 miles). No performance figures are yet available, as the machine is, as already mentioned, at present undergoing tests.



["FLIGHT" Sketch

For handling on the ground the Albatros twin-engined commercial machine is provided with tubular hand-rails under the stern of the fuselage.

The Savoia S.59

Strictly speaking, the Savoia S.59 flying-boat exhibited on the Italian stand is not a commercial machine in that it is evidently a training type, and it is not therefore proposed to give a detailed description of it here. One of our photographs will show the general appearance of the machine.

THE LARGE COMMERCIAL MACHINES

As was to be expected from an exhibition intended to be purely civilian in character, a large number of commercial aeroplanes, apart from the flying-boats already described, are shown at the I.L.A. In the following notes we have attempted to group the commercial machines according to size into "large" and "small" types. It will be realised that there is no hard and fast rule which can be applied in selecting the class into which, according to this arbitrary division, any particular machine should fall, but machines with seating accommodation for more than eight persons have been classified "large," while those with eight places or less have been placed in the "small" class. The latter is actually represented at the Berlin Show by a greater number of machines, a fact not surprising when it is remembered that Germany, and most European countries with the exception of England, operates short routes on which the volume of traffic is not such as to justify the use of the large machines to which we are accustomed in this country.

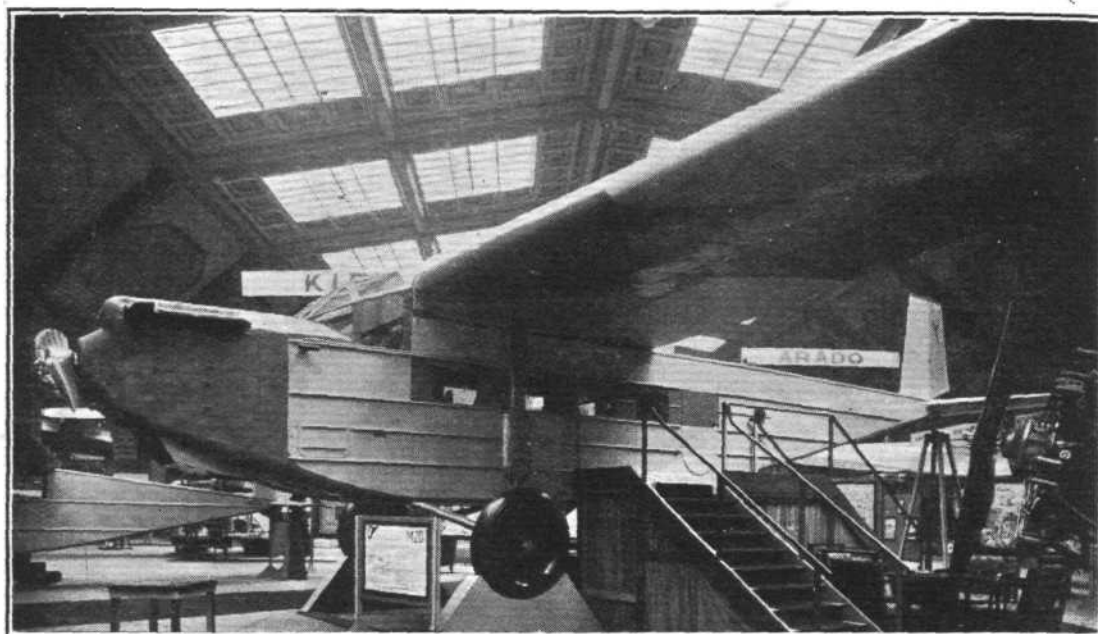
The Aero A.23

This machine, which was also exhibited at the Paris Show held in the summer, is of a type used on the Czech State Airways, and is a normal single-engined biplane, largely of wood construction. The engine is a Walter "Jupiter," and the cabin has seats for six passengers, while the cockpit, placed aft of the cabin, has two seats for pilot and navigator, or two pilots. The machine is not unlike the D.H.61 in a general way, but the lines are not very pleasing, or possibly it may be the rather crude colour scheme chosen which spoils the appearance of the machine. The cabin appears very comfortable, and the machine is reported to have proved very reliable in service.

The "Schlafwagen": The Albatros L.73 has its seats so arranged that they can be tilted to form couches at night.



A German
 Newcomer: The
 B.F.W.M.20, de-
 signed by Herr
 Messerschmitt,
 is a large all-
 metal cantilever
 monoplane. The
 engine is a
 B.M.W.



The total loaded weight of the A.23 is 3,200 kg. (7,040 lbs.), and the disposable load 1,350 kg. (2,970 lbs.). With full tanks the fuel weight is 450 kg. (990 lbs.), and the oil weight 40 kg. (88 lbs.).

The Albatros L.73a

■ Built mainly of metal, the L.73a exhibited by the Albatros Works is a development of the earlier type L.73, which was nicknamed the "Schlafwagen" on account of the type of seats used, which could be tilted back to form couches for night flying. The machine is of fairly orthodox design if one accepts as such a twin-engined type, which is now disappearing in this country. The L.73 A is powered by two Bristol "Jupiter VI" engines, and is stated to be very pleasant to fly, and to manoeuvre well, even with one engine stopped. Whether the machine is definitely able to fly level on one engine we were unable to ascertain.

The very comfortable cabin has eight seats for the passengers, and these seats are so arranged that when the machine is used for operating a night service they can be tilted back to form not uncomfortable couches. Whether the machine has ever been regularly employed on a night service we do not know. The type is stated to be in service on the lines of the Luft Hansa.

The main dimensions and weights of the Albatros L.73 A are as follows: Length o.a., 14.9 m. (48.9 ft.); wing span,

19.7 m. (64.6 ft.); wing area, 92 sq. m. (990 sq. ft.). Weight empty, 3,300 kg. (7,260 lbs.); permissible useful load, 2,200 kg. (4,840 lbs.). Total loaded weight, 5,500 kg. (12,100 lbs.). Maximum speed, 175 km./h. (109 m.p.h.); cruising speed, 160 km./h. (100 m.p.h.). Range at full throttle (5 hours), 875 km. (543 miles). Range at cruising speed (6 hours), 960 km. (600 miles). Climb to 1,000 m. (3,280 ft.) in 7 minutes. Ceiling, 3,200 m. (10,500 ft.).

The B.F.W. M.20

The Bayerische Flugzeug Werke, of Augsburg, is the firm which took over the Udet Co. some years ago, and of which Herr Hermann was then chief designer. The new firm has chosen as their chief designer Herr Willy Messerschmitt, who will be familiar to readers of FLIGHT as the designer of the little Messerschmitt monoplane with Bristol "Cherub" engine on which some very noteworthy flights were made a few years ago. At the I.L.A. Herr Messerschmitt is represented, on the B.F.W. stand, by a series of different types, of which the large commercial monoplane M.20 forms the subject of the present notes.

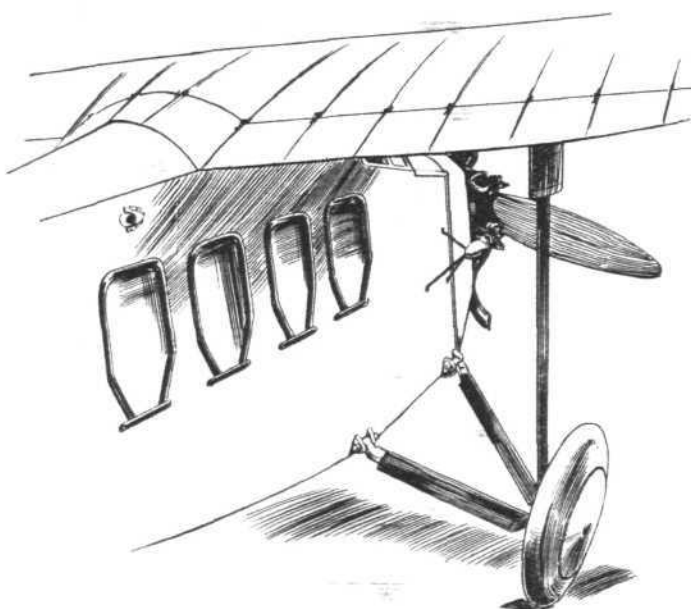
Built entirely of metal, the M.20 is a pure cantilever monoplane of large dimensions and considerable load-carrying capacity. The extremely comfortable cabin has seats for 10 passengers, and, as in the case of the Albatros L.73, the seats are arranged to be capable of being tilted



Ambitious! The
 twin-engined
 Farman com-
 mercial biplane
 is shown with-
 out wings, as at
 the Berlin Show,
 and is a great
 centre of attrac-
 tion.



The Focke-Wulf "Moewe" with "Jupiter" engine is a development of earlier and smaller machines of the feeder line type. Cantilever wings and a wide wheel track are features of the design.



["FLIGHT" Sketch]

The Focke-Wulf "Moewe" has the telescopic member of its undercarriage running to the cantilever wing.

back to form couches should the passengers desire to sleep.

A large sloping wind-screen in front of the pilots' cockpit, itself placed ahead of the wing, affords ample protection against the weather, and, at the same time, the opening left in each side enables the pilot to lean out should the windows be covered with moisture or snow, or in taking off or alighting. The fuselage construction is entirely of metal, mostly Duralumin, and the covering is in the form of flat sheet, stiffened by widely-spaced longitudinal corrugations.

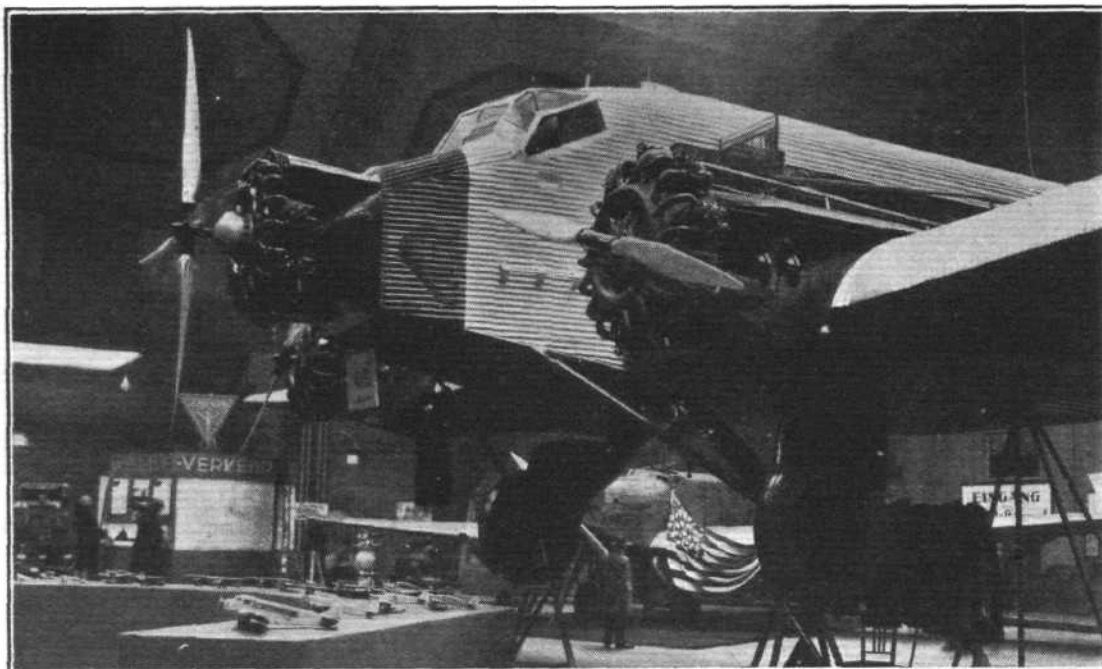
The wing construction is of considerable interest, since Herr Messerschmitt has incorporated in it his experience with very small monoplanes. Readers of *FLIGHT* who studied German glider design before the subject lost interest in England will possibly remember that a form of wing construction became very popular in Germany by which but a single spar was employed, this forming, in conjunction with a three-ply nose covering, a sort of box of D-section, which was found very strong not only in direct bending but also in torsion. This same principle has been applied by Herr Messerschmitt in the case of the M.20, only metal has been substituted for the three-ply wood. The single main spar is of double T section, and placed at the deepest point in the aerofoil. A fairly substantial metal covering over the leading edge and extending some distance aft of the spar serves to form, with the spar, the D-section box of the earlier small machines. We are informed that sand load, etc., tests have proved the wing to have a very excellent

Side by Side:

The Blackburn "Bluebird," although placed under the gallery, is very effectively displayed, and its "sociable" seating arrangement is favourably commented upon.



The Junkers G.31 has three "Jupiter" engines, of which the central engine is fitted with a four-bladed propeller. This engine is geared, while the wing engines are direct-drive types.



strength/weight ratio, and the structure weight of the machine would seem to indicate very economical construction. One criticism of the wing comes to mind in connection with the one-piece construction. A monoplane wing of such dimensions must be rather difficult to transport. The two petrol tanks are housed inside the wing, one on each side of the fuselage. Their total capacity is 716 litres (157 gallons).

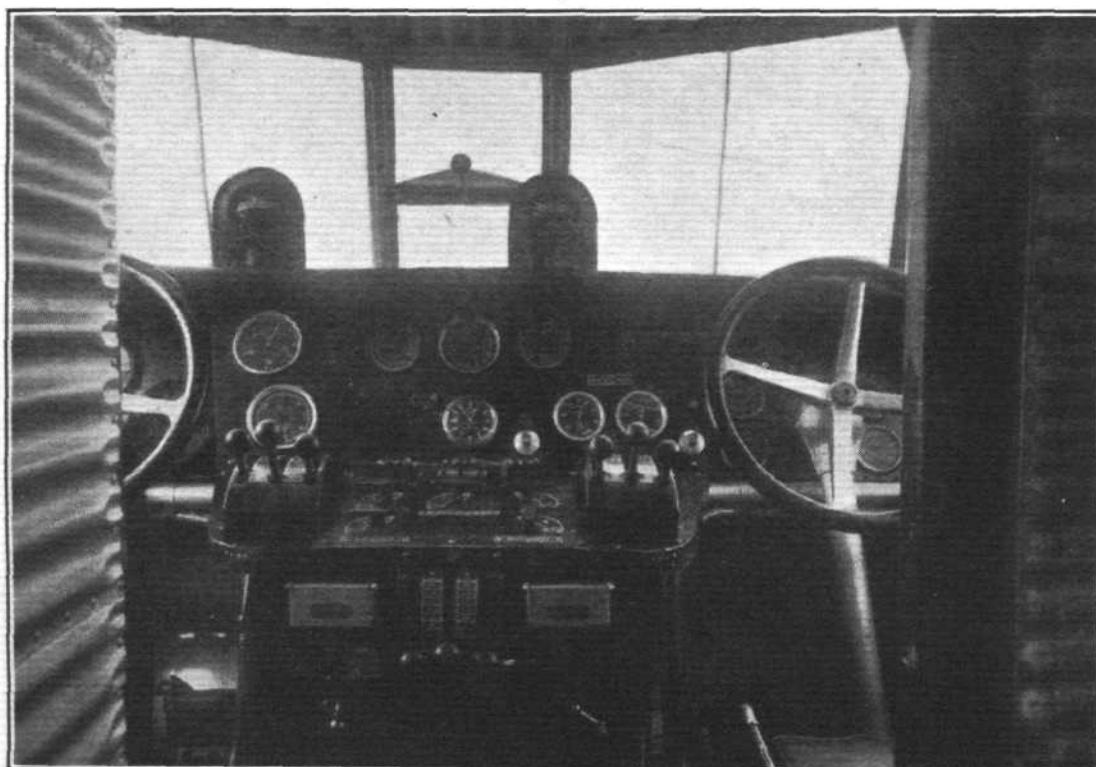
The main dimensions and weights of the B.F.W. M20 are: Length o.a., 14.9 m. (48.8 ft.); wing span, 25.5 m. (83.6 ft.); wing area, 65 sq. m. (700 sq. ft.). Weight empty, 2,400 kg. (5,280 lbs.). Permissible load, 2,100 kg. (4,620 lbs.). Total loaded weight, 4,500 kg. (9,900 lbs.). Engine B.M.W. VI, with compression ratio, 5.3:1. Farman reduction gear. Maximum power, 700 b.h.p. at 1,700 r.p.m.; normal power, 500 b.h.p. at normal speed of 1,530 r.p.m. Wing loading, 69 kg./sq. m. (14.15 lb./sq. ft.). Power loading (on normal power), 19.8 lb./b.h.p. Maximum speed at ground level and normal power, 175 km./h. (108.5 m.p.h.); cruising speed near ground at 10 per cent. throttling, 154 km./h. (95.6 m.p.h.). Climb to 1,000 m. (3,280 ft.) in 8 minutes. To 2,000 m. (6,500 ft.) in 17 minutes. To 3,000 m. (9,840 ft.) in 27 minutes. Ceiling, 5,000 m. (16,400 ft.). Normal range 880 km. (550 miles).

The Farman F.180

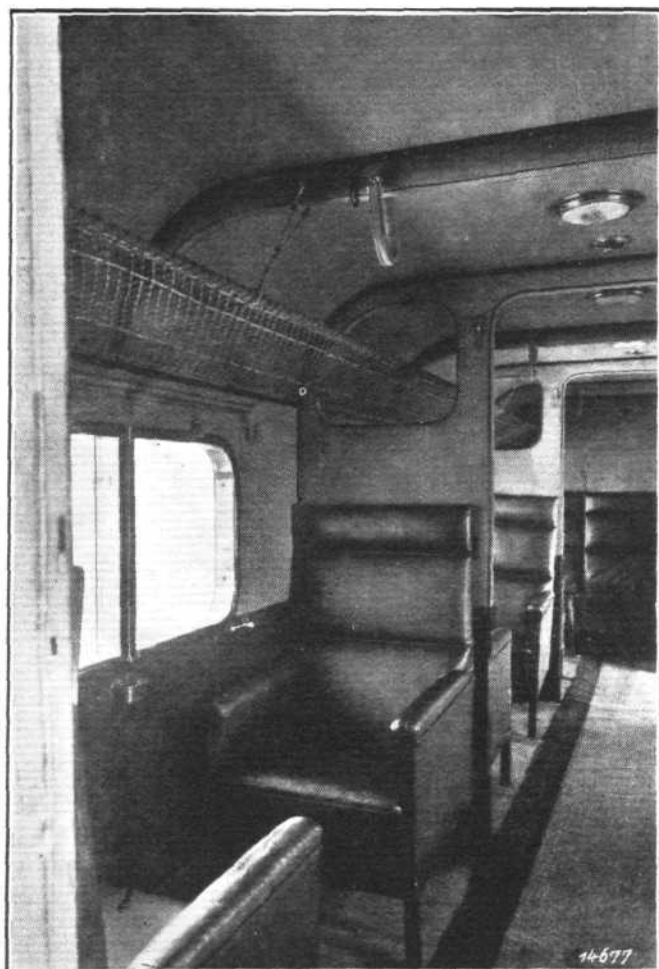
In view of the fact that it was exhibited at the Paris Aero Show in July last, no lengthy description of the large Farman twin-engined machine is considered necessary here. As at Paris, only the fuselage with wing stumps and engines is shown in order to conserve stand space. One of our photographs shows the machine as exhibited. The two Farman engines are mounted in tandem above the fuselage, a location which precludes the employment of gravity feed to the carburettors.

The Farman F.180 is conceived as a de luxe machine for the carrying of passengers in the greatest possible comfort over considerable distances. Perhaps by the time a France-South America service for passengers becomes possible the type may find practical application. At present it seems doubtful if such a machine could be made to pay.

With a wing span of 26 m. (85 ft.) and a wing area of 172 sq. m. (1,850 sq. ft.), the Farman F.180 has a tare weight of 4,500 kg. (9,900 lbs.) and a total loaded weight of 8,000 kg. (17,600 lbs.). The maximum speed is given as 190 kms. per hour (118 m.p.h.) and the cruising speed as 170 kms. per hour (106 m.p.h.). With full load the ceiling is 4,000 m. (13,100 ft.), and it is claimed that provided the loaded weight



The Junkers G.31: View of the pilots' cockpit, showing dual controls, etc.



View inside the cabin of the Junkers G.31.

does not exceed 7,000 kg. (15,400 lbs.) the machine will fly on one engine.

The Focke Wulf "Moewe"

In common with not a few German aircraft firms, the Focke Wulf Flugzeugbau of Bremen have developed their large commercial aircraft from smaller types previously in use during the period when Germany was prevented by the Inter-Allied Commission from producing and operating machines of more than a certain limited size and power. Thus the largest machine on this stand, the "Moewe" type A.17a, is a direct development of previous small "feeder line" types of machines, the general outline of which the "Moewe" retains. The "tail-first" type which this firm produced last year is not represented at the Show, but it is of interest to learn that the type will be proceeded with experimentally, as it is held that the accident which resulted in the death of Dr. Wulf last year was of a nature which might have befallen any type of machine, and not necessarily a result of the tail-first arrangement. We were informed on the Focke Wulf stand that the new "Ente" may be expected in about six months' time.

However, this is by the way. The subject that concerns us at present is the "Moewe." "Wirtschaftlichkeit"—or, in other words, economy in operation—was the first consideration of the designer of the machine. In his view—a view, by the way, which is not universally shared in England—economy is to be obtained by a high ratio of paying load to engine power. In the "Moewe" this ratio is represented by a pay load in the form of eight passengers for a single engine of 480 h.p. (geared "Jupiter").

The machine is of "mixed" construction in that the fuselage is a welded-steel tube structure, while the cantilever monoplane wing is an all-wood structure in which the three-ply wing covering is employed to stabilise the internal wing skeleton, and thus takes part of the load imposed on the wing. The fuselage is fabric-covered except for the cabin portion, which has three-ply walls in order to deaden the engine noise, and the engine mounting, which is covered with aluminium sheet.

It has always been a feature of the Focke-Wulf machines that the cabin floor is raised but slightly above the ground. This feature has to a large extent been retained in the

"Moewe," in which a small tubular step is all that is required for entering and leaving the cabin. The latter has six wicker seats arranged in two rows, one along each side of the cabin, and a small sofa seat for two against the rear wall. A door in the forward wall communicates with the pilot's cockpit, which is placed ahead of the leading edge of the wing and protected by a large wind-screen. Dual controls are provided as in most large German commercial machines, so that either two pilots or one pilot and a navigator who can act as occasional pilot may be carried.

The undercarriage is the type now so popular in Germany, in which a Vee of steel tubes projects laterally from the sides of the fuselage and carry the wheel axle, while a third strut runs to the wing. This latter strut is sometimes arranged as a telescopic member, but in the "Moewe" it is solid, the springing being obtained by rubber cords passing over a cross-piece on the top of this strut and anchored inside the wing profile. A fairly wide wheel track is provided in this manner, although British designers might object to imposing landing shocks thus direct on to their wing structure. The arrangement does not, however, appear to give any trouble in actual use.

The engine used in the "Moewe" A.17a is a geared "Jupiter" mounted on a steel tube structure. The petrol (500 kg. = 1,100 lbs.) is carried in two tanks in the leading edge of the wing, and direct-gravity feed is employed.

The main dimensions of the "Moewe" are: Length, o.a., 13 m. (42.7 ft.); wing span, 20 m. (65.6 ft.); wing area, 62.5 sq. m. (673 sq. ft.). Tare weight, 2,450 kg. (5,380 lbs.); permissible load, 1,550 kg. (3,410 lbs.); total loaded weight, 4,000 kg. (8,800 lbs.); maximum speed, 201 km./h. (125 m.p.h.); cruising speed, 175 km./h. (108 m.p.h.); landing speed, 90 km./h. (56 m.p.h.); climb to 1,000 m. (3,280 ft.) in 6.6 mins.; ceiling, 5,000 m. (16,400 ft.); range, 800 km. (500 miles).

The Junkers G.31

In our issue of last week we commented on the fact that the Junkers stand at the I.L.A. is separated from the rest of the stands of the German aircraft constructors by a high partition so as to hide it entirely from view when viewed from the main body of Hall I. The explanation for this is now found to be that Junkers is not a member of the Society of German Aircraft Constructors, and that thus the Junkers exhibit is to be regarded as one separate from the I.L.A., at which it was not originally Junkers' intention to exhibit at all. Whether the tall partition was dictated by a feeling



THE PRETTIEST MACHINE IN THE SHOW: The D.H. "Gipsy-Moth" is generally admired for its good lines. Unfortunately, the floats, skis, etc., surrounding it rather detract from its appearance.



of modesty or by one of superiority and aloofness we are naturally not in a position to say. To foreign visitors, the spectacle of a German aircraft constructor exhibiting in the German hall of the exhibition, but separated therefrom by a high wall is rather amusing, and would not easily find its counterpart in any other country. Germany may have turned democratic, but the spirit does not yet appear to have permeated the whole of the German aircraft industry.

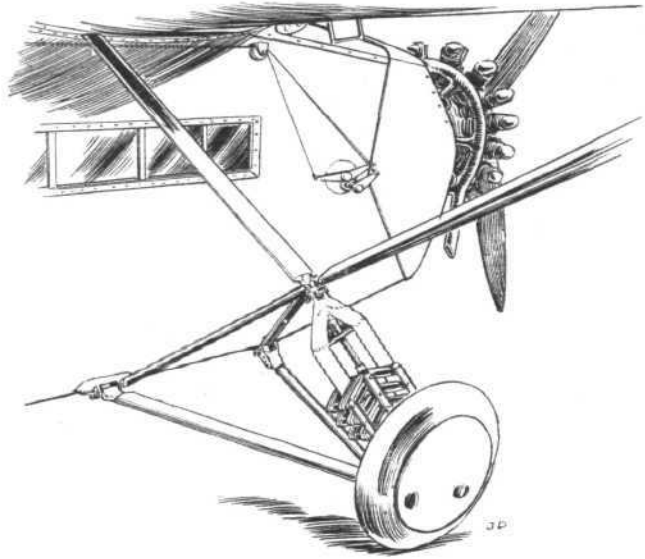
The Junkers' stand is one of surpassing interest, and the fact that almost any accredited visitor to the stand can fairly easily arrange for a visit to the works at Dessau proves that the firm does not believe in secrecy. In fact, it is probably this very hospitality which accounts in a large measure for the extent to which Junkers aircraft are known the world over to-day. One may not be an admirer of the forms of construction which Professor Junkers has developed. It is not very difficult to find fault with them on theoretical grounds, but like Fokker's welded steel-tube fuselage construction, the "proof of the pudding is in the eating." The machines do appear to stand up to their work, and with the mass-production plant which has been created at Dessau, the cost of the Junkers machines is relatively low.

One might write at great length on the exhibits other than complete aircraft on the Junkers' stand, but the present section is intended to deal with large commercial aircraft only, and this narrows the subject down to the large G.31 three-engined machine shown in the centre of the stand, with two smaller types on either side.

The Junkers type G.31 is not a new type, having been in regular use for some time not only on the internal German lines but also on the London route, so that visitors to Croydon aerodrome will already be familiar with the machine. The writer of these notes has not yet had the pleasure of travelling in the Junkers G.31, but he has spoken to quite a large number of air travellers who have made flights in this machine, and one and all are agreed that for sheer comfort the G.31 would be hard to beat. The rigidity of the multi-spar wing structure, and the padding of the cabin walls result in a saloon in which it is quite easy to carry out a conversation with a fellow passenger in a normal voice. That the extra weight of the cabin equipment must of necessity increase the tare weight of the machine, and thus either result in a smaller pay load or a greater power loading must be admitted, and the G.31 represents in this respect a policy which departs rather notably from that adhered to by our own air line company, the directors of which have

internal structure partly tubular and partly of built-up channel section members.

On the exhibition machine the central engine is of the geared type and drives a four-bladed airscrew, while the



["FLIGHT" Sketch]

The Arado Commercial Monoplane has a fairly elaborate arrangement of wing and undercarriage strutting, as shown in this sketch. The shock absorbing element is in the form of rubber rings, arranged as in the Fokker machines.

two wing engines are direct drive and fitted with two-bladed propellers.

Reference has already been made to the comfortable cabin. The cockpit also is exceptionally well appointed, and protected by large wind screens. One of our photographs shows a portion of the cockpit, from which the very excellent lay-out of the controls, instruments, &c., can be seen.

The Arado V. is
 passenger mono-
 plane fitted with
 Pratt & Whitney
 "Hornet" en-
 gine.



always placed greater importance on having a good power reserve than on giving the passengers a maximum of comfort. Constructionally the G.31 follows normal Junkers practice. The low monoplane wing is of the familiar multi-spar construction, with covering of corrugated Duralumin. The fuselage is covered with the same material, and has an

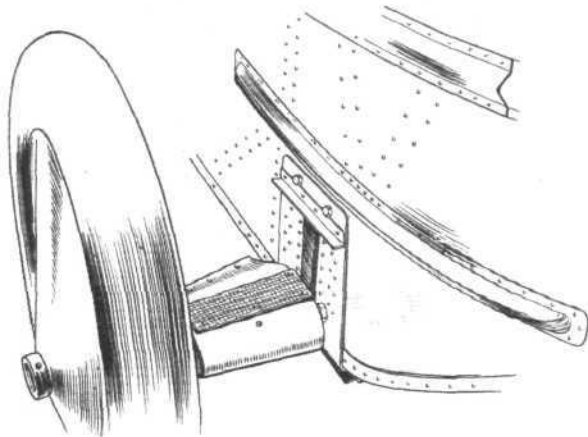
The main dimensions of the Junkers G.31 are: Length o.a., 16.2 m. (54.1 ft.); wing span, 30.5 m. (100 ft.); wing area, 94.5 sq. m. (1,015 sq. ft.); tare weight, 4,400 kg. (9,675 lbs.); permissible load, 3,600 kg. (7,920 lbs.); total loaded weight, 8,000 kg. (17,595 lbs.). Maximum speed, 205 km./h. (127 m.p.h.).

OCTOBER 18, 1928



SMALL COMMERCIAL AIRCRAFT AT BERLIN

In this section of our notes on the Berlin Show we do not intend to include machines other than those expressly designed for passenger carrying, and more specifically for



["FLIGHT" Sketch]

The B.F.W. M18 has its wheel axle projecting out through the side of the fuselage, the axle fairing serving to form a step, as shown in this sketch.

carrying but a relatively small number of passengers. Reference has been made above to our definition, for the purpose of the present classification, of "large" and "small" commercial machines. We do not propose to include among commercial machines such types as the Russian mail plane or the Heinkel machines, etc., as these are not passenger types. These, as well as the light aeroplane class, will,

being intended mainly to stiffen the wing against torsional stresses. The cabin has four seats, all passengers facing forward. Aft of the cabin is a luggage compartment, while in the forward wall is a door communicating with the cockpit. The latter has two seats, side by side, so that if necessary two pilots can be carried, or the extra seat may be occupied by a passenger.

The fuselage is of welded steel tube construction, fabric covered over the rear portion. The fuselage decking is detachable so as to facilitate inspection of the fuselage bracing, &c. In front the engine, a B.M.W. Pratt & Whitney "Hornet," is separated from the pilot's cockpit by a fireproof bulkhead. The petrol tanks are mounted one on each side, inside the wing, giving direct gravity feed to the carburettor. Their capacity is 585 litres (129 gallons).

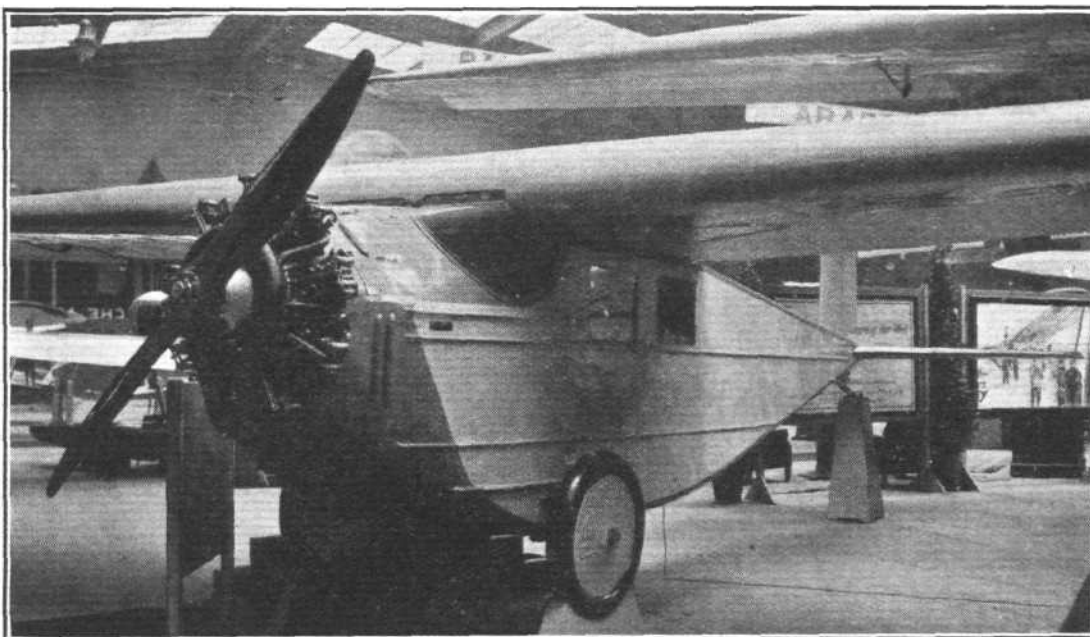
The monoplane wing is, as distinct from a number of German monoplanes, built in two sections to facilitate storage and transport, and is of wood construction with three-ply covering.

The undercarriage is of wide track, and the member carrying the shock-absorbing medium is not taken to the wing as in so many machines, but to the fuselage via the junction of the wing struts to a pair of short struts running to the lower longerons. One of our sketches illustrates the arrangement.

The Arado V. I has an overall length of 12 m. (39.4 ft.), a wing span of 18 m. (59.1 ft.), and a wing area of 47.24 sq. m. (508 sq. ft.). The tare weight is 1,350 kg. (2,970 lbs.) and the permissible load 1,000 kg. (2,200 lbs.) giving a total loaded weight of 2,350 kg. (5,170 lbs.). The wing loading is thus 50 kg./sq. m. (10.2 lb./sq. ft.) and the power loading (on 500 b.h.p.) 4.7 kg./h.p. (10.33 lb./h.p.). No detailed performance figures are available, but the maximum speed is stated to be in the neighbourhood of 200 km./h. (124 m.p.h.).

The B.F.W. M18

Surely, one of the most economical small passenger machines ever produced must be the little Messerschmitt M. 18 built, and exhibited by the Bayerische Flugzeugwerke. Of all-metal construction, this little machine is designed to carry four passengers and one pilot with an engine of 100 h.p. only, or a power expenditure of only 20 h.p. per occupant! Not



The B.F.W. M.18
 is a small "feeder
 line" type of
 monoplane of all-
 metal construc-
 tion.

however, be dealt with in next week's issue. The following types include machines designed to carry four to six passengers in addition to the pilot.

The Arado V. I

The Arado Company, of Warnemünde, exhibits two machines, of which one is the two-seater shown at the last Paris Show, and which is a school and practice type. The other is quite a new type of small passenger plane, which, so far as we are aware, makes its first appearance at the Berlin Show, and has not yet been put into general service. This machine is known as the type V. I (the letter V presumably standing for Verkehrsflugzeug). It is a high-wing monoplane of the semi-cantilever type, the bracing struts

only so, but the range of this amazing little machine is given as 600 km. (373 miles). Whether this figure is merely an estimated one, or has been attained in practice, we do not know. The M.18 is not a new machine, but has been in use for some years, and thus the performance figures given at the end of these notes are probably reliable. It would certainly appear that the machine is entitled to a close examination, both on account of its economy in operation and because of its aerodynamic design. In our opinion, Herr Messerschmitt is one of the rising German designers, and his work now and in the future should be watched with interest by British designers, the more so as the small commercial machine is now being studied in this country with a view to meeting the requirements of the British Dominions.

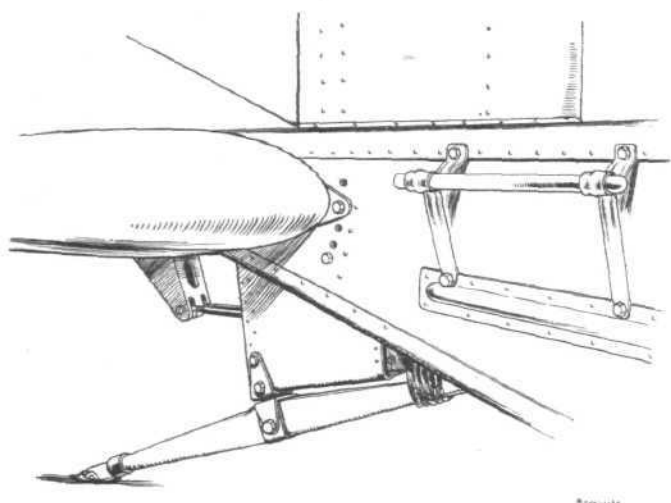
The M.18 attains its economy of operation partly by

efficient aerodynamic design, resulting in a very small power requirement, and partly by clever construction which gives a most unusual ratio of weight carried to tare or empty weight.

On the aerodynamic side it is seen that, to begin with, Herr Messerschmitt has chosen a fairly large span (15.6 m.) in order to keep down induced drag. As the span is 51.2 ft. and the total loaded weight is 2,640 lb., the ratio $\frac{\text{span}^2}{\text{weight}}$ is nearly 1, a very high figure for a commercial machine. This means that at 80 m.p.h., for instance, the cruising speed of

a figure which will permit the load carried by the machine to be equal to the tare weight. The fuselage is built of former, and stringers of "open" sections to facilitate inspection of rivets, &c., and covered with flat Duralumin sheet. The monoplane wing shows the same type of single spar construction as the large M.20, the wing covering being Duralumin sheet over the front portion, and fabric near the trailing edge.

The little cabin is quite comfortable, although naturally somewhat small, and the pilot's cockpit is well protected, while at the same time the view forward is quite good.



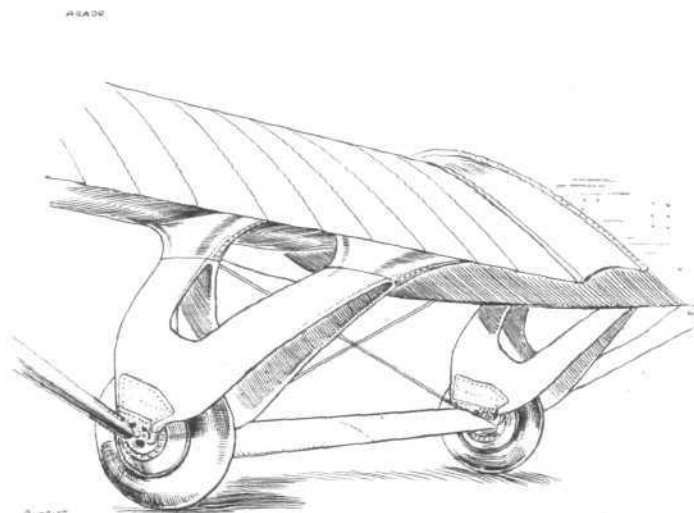
["FLIGHT" Sketch]

Sketch showing tail skid, central elevator crank and handling rail on the B.F.W. M.18.

the machine, the ratio of lift to induced drag is in the neighbourhood of 50. At 60 m.p.h., or somewhere in the region of the take-off speed, this ratio will still be as high as 30 or so, thus helping materially in enabling the machine to take off with a high load per horse-power.

Great care in streamlining the nose of the machine, by cowling the engine, etc., has probably resulted in another reduction of drag, while the undercarriage has been kept of such an elementary form that its drag is probably also quite low, the axles springing straight out through slots in the sides of the fuselage, as shown in one of our sketches. The fuselage itself, although of the flat-sided variety, appears of reasonably good form, and altogether the minimum drag of the M.18 is probably extremely low.

It is a little more difficult to discover how Herr Messerschmitt has managed to keep his structure weight down to



["FLIGHT" Sketch]

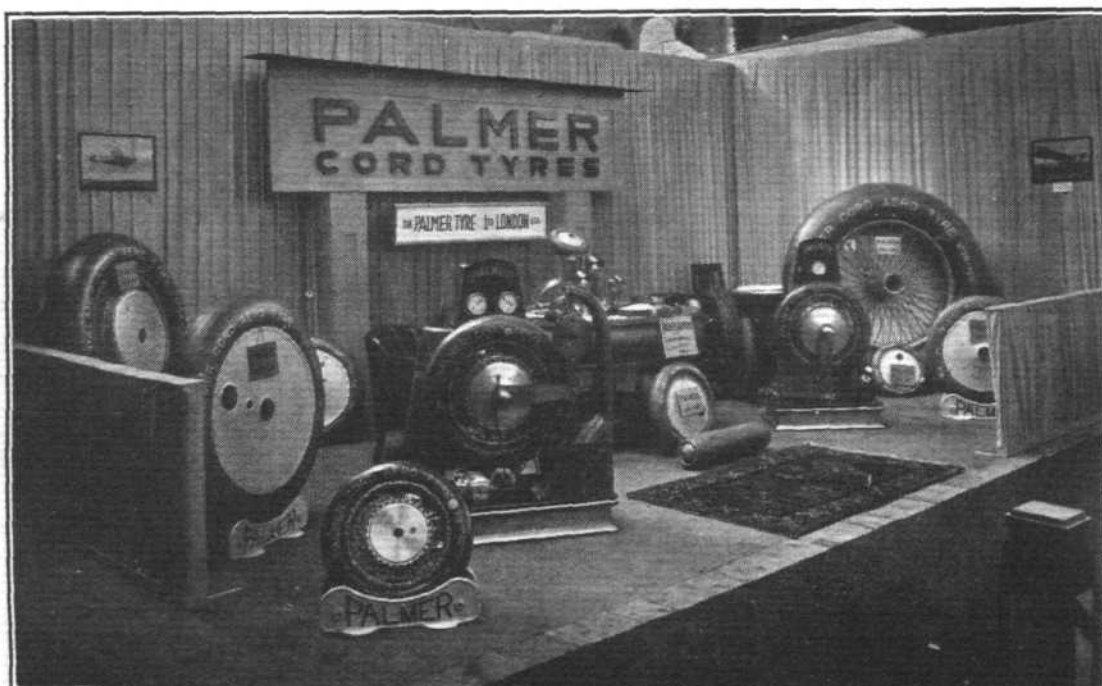
Details of the mounting of the wheel on the Bleriot III. The wing bracing strut is attached to the wheel centre, the wheels being internally sprung.

Although designed primarily for passenger carrying, the M.18 can be used for a variety of other purposes. For instance two of the seats can be removed and the machine used for photographic work, a detachable plate in the floor making it possible to mount a camera there.

The type M.18 has for some years been in service on the lines of the North Bavarian Flying Company of Fürth, and is reported to have proved very satisfactory, being reliable and very economical in operation.

The B.F.W. M.18 has an overall length of 8 m. (26.3 ft.), a wing span of 15.6 m. (51.2 ft.), and a wing area of 24.5 sq. m. (264 sq. ft.). The tare weight is 600 kg. (1,320 lb.) and the permissible load 600 kg., giving a total loaded weight of 1,200 kg. (2,640 lb.). The engine is a Siemens radial, type S.H.12, rated at 100 h.p. at normal revolutions. The power

The Palmer
Stand at
Berlin Show.
In the centre
is seen the
demonstration
model of the
new aircraft
wheel brake.





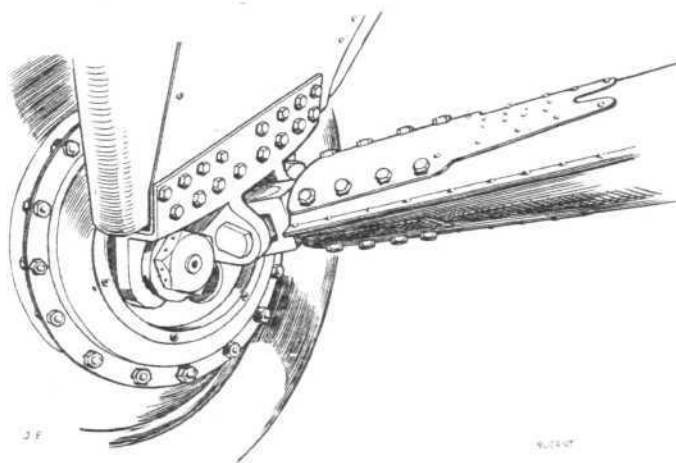
Bleriot's Latest :
The Bleriot 111
is an inter-
mediate-size
passenger mono-
plane with wings
placed low on the
fuselage.

loading on this basis is thus 26.4 lb./h.p. and the wing loading 10 lb./sq. ft. The maximum speed is 140 km./h. (87 m.p.h.) and the cruising speed 130 km./h. (about 80 m.p.h.). The ceiling is 3,000 m. (9,840 ft.). The range (presumably at cruising speed) is 600 km. (373 miles).

The Bleriot 111

Described as a machine for commercial work or touring, the Bleriot type 111 is a single-engined low-wing monoplane with streamline fuselage and a cabin seating four passengers, while the pilot is placed *en conduite intérieure* between the engine and the cabin. The machine is of rather pleasing appearance, although one might regard the employment of a nose radiator as a retrograde step. Whether the nose radiator is as bad as one is apt to assume in modern times is, perhaps, a somewhat debatable point. The radiator is a good deal of a nuisance to the aircraft designer, and it somehow looks less out of place in the nose than anywhere else.

Constructionally, the Bleriot 111 is a normal machine in that the fuselage is a wooden *monocoque* structure, while the wing has spars and ribs of wood, with covering partly of fabric and partly of three-ply. The wing is in two halves,



The internally-sprung wheels on the Bleriot 111 are accommodated in a rather unusual form of under-carriage arrangement.



A STUDY IN "NOSES" : On the left the "Cirrus-Avian" and on the right the "Genet-Avian." Note the novel arrangement of the exhaust pipes on the latter.

attached to wing roots projecting from, and built integral with, the fuselage.

The undercarriage is somewhat unusual, in that use is made of the Bleriot type of internally-sprung wheels, the wheel axles being rigidly mounted in double struts coming down from the wing roots. A rigid strut connects the two wheel centres, and from the outside of the wheel axles Duralumin struts run to the wing spars.

Beyond the fact that the wing area is 34 sq. m. (353 sq. ft.), no information was available as to the dimensions of the Bleriot 111. The empty weight is given as 1,200 kg. (2,640 lb.), and the permissible load as 1,000 kg. (2,200 lb.), giving

a total loaded weight of 2,200 kg. (4,840 lb.). The useful load is made up as follows: Pilot and instruments, 95 kg. (209 lb.); 4 passengers and luggage, 400 kg. (880 lb.); 640 litres (141 gallons) of petrol, 460 kg. (1,000 lb.); 50 litres (11 gallons) of oil, 45 kg. (100 lb.). Engine, 280 h.p. Hispano. Maximum speed, 195 km./hr. (121 m.p.h.); cruising speed, 170 km./hr. (105 m.p.h.). Duration at cruising speed, 9 hrs. Range at cruising speed, 1,550 km. (963 miles). The petrol is carried between the cabin and the pilot, not a very reassuring position.

(To be continued)



ON THE HANDLEY PAGE STAND : The ex-Crown Prince of Germany is interested in the model used for demonstrating the operation of the automatic slot. With him is Madame de Landa, D.B.E., and Sqn.-Ldr. Tom England.

PRIVATE



FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

A WEST OF IRELAND TOUR

By LADY HEATH

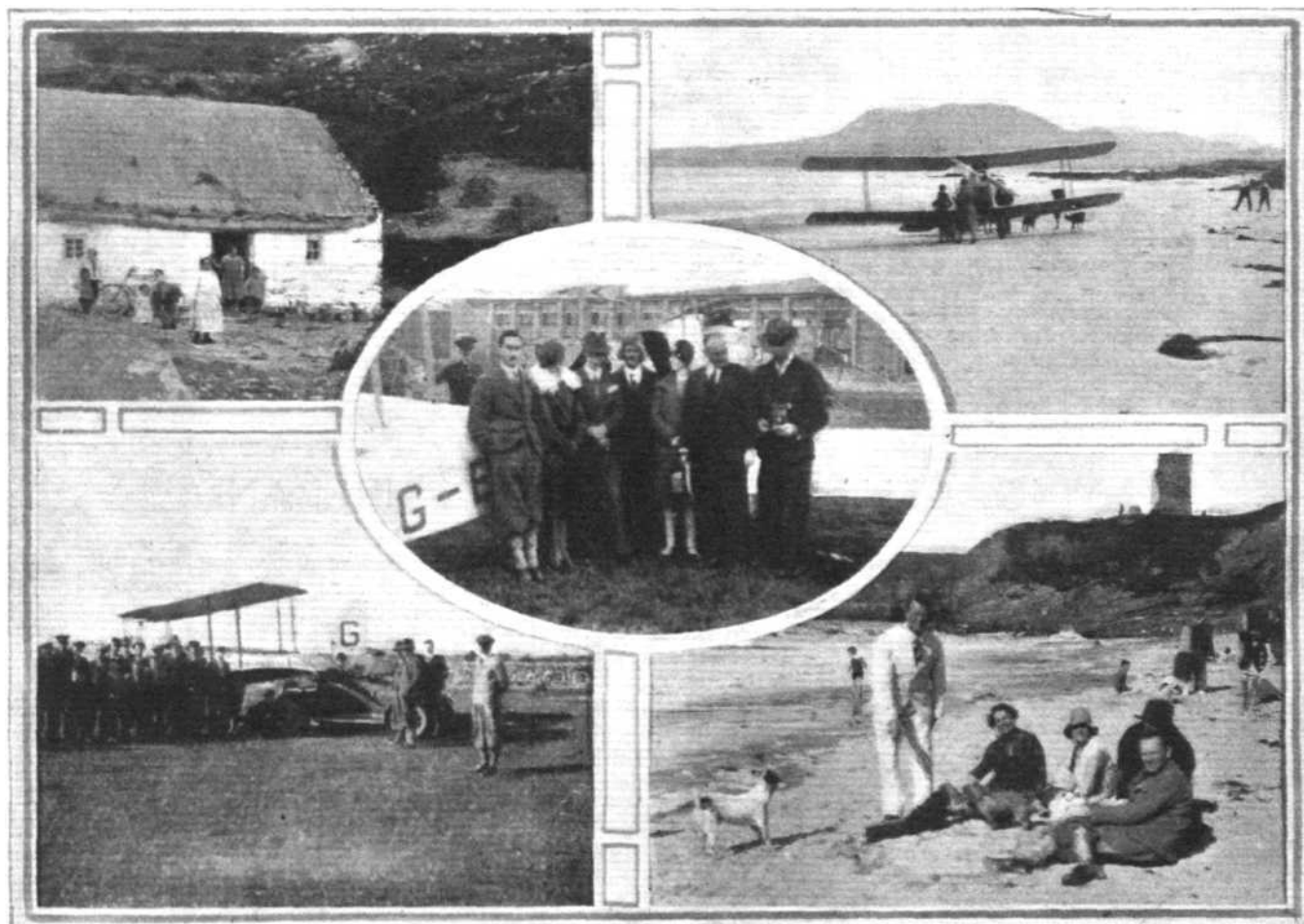
I LEFT Stag Lane, with Miss Molly McGovern, as passenger, about noon on August 22, and sped towards the North of England, a complete coward at the thought of the 60 miles of water between Holyhead and Dublin. One of our ports of call for petrol was the Blackpool Aerodrome where the Lancashire School of Aviation is functioning. Everyone should make that a point of call. I was absolutely unable to get those good people to accept any money for the petrol I filled up with. Perfect hospitality.

A very thick sea fog and a drizzle of rain made us chary of crossing from Stranraer to Aldergrove that evening. We had been rash enough to spend a very happy couple of hours with the Lancashire Club at Woodford and so it was 7 o'clock before we crawled round the coast a couple of hundred feet above the sea at Stranraer. Then the difficulty of choosing an "aerodrome" began. The sea fog made it almost impossible to distinguish the surface of the contours and when we finally landed on the clearest patch we could find, we discovered we were more or less at the side of a Scottish Alp. We tied the D.H. "Moth" to the fence of a cottage in a corner and left it to the rain and the winds for the night. In the morning we had to get the piling down between two fields to get away, but all the country folk were terribly thrilled and wanted to fly themselves.

It was a beautiful morning for the North of Ireland, with

fleecy clouds flecking the sky, but after we had said adieu to our friends at Aldergrove, our port of call, the weather began to get worse. Belfast has started a light aeroplane club of its own and during the week of our visit they got 100 members enrolled, and two private owners have promised to buy machines.

Although the ground South of Drogheda is only a couple of hundred feet high the clouds were so low that we could not go under them and when we climbed above we could see an unbroken stretch of grey cloud mass hiding the objective, Dublin, and so perforce we had to go down again and so to sea. I have never seen clouds so low without touching the water. Our wheels were a few feet off the sea and the top of our petrol tank was touching the cloud layer. And so we wound our way round the tortuous coastline of Balbriggan, Malahide and Skerries. We could not even cross the low neck of land between Hoath Head and Dublin but had to go the whole way round. The nearest we could get into Dublin was on the golf links at Dollymount, which are actually on the sea level. If anything, the clouds appeared to be getting thicker, and so we decided it would be impossible to try and get to Baldonnell, the Irish Free State service aerodrome the other side of the town. There was a path to a garage opposite the golf club, but the path was between sand dunes high on either side so we had to resort to the expedient of taxi-ing



Views taken in the wake of Lady Heath's recent air tour of her own country, Ireland. In the centre group are members of the Irish Aero Club. Left to right: Mr. J. Mulligan and Mrs. Mulligan; Col. Russell, of the Irish Free State Air Force; Mr. Rowan, Chairman of the Club; Mrs. and Mr. Finton Fitzpatrick and Dr. Spencer-Shailes. The group below (right) includes Mr. Reid (in white), Mrs. Reid (centre), and Mr. Sheppard (nearest the camera).

the machine a full half-mile with the wings folded. It worked beautifully. Other D.H. "Moth" owners when trying this should be warned to keep the tail about 6 or 7 in. off the ground, or the wings will get scraped. This can very easily be done with the "Heath Patent Tailskid Trolley"—an arrangement on little wheels I have since patented. On Sunday morning we dug the machine out of this garage and with the help of every caddy the Club possesses took it down to the beach again after the engine had been tidied up.

With the Irish Aeroplane Club.

There was only a hundred yards run into wind between the coast and the tide mark, but with the chairman of the newly formed Irish Aeroplane club clinging tightly to a strut and praying for all he was worth the machine left the close white waves underneath. That morning was spent in taking the members of the Irish Aero Club up for joy rides. Three members who had never been up before came down with their wives to see the flying—their wives having ostensibly come to keep them from going into the air. What actually happened was that the three wives went into the air before their husbands. Next morning we started for the South. A pilot from Worthydown, Mr. Shepherd, wanted to be dropped at his home Rathagen in Co. Kildare, a lovely little Irish village nestling in a curve of the Highlands. We found the only available large field was in hay cocks, and we had to use a little one less than 200 yards across and surrounded by high trees.

We flew among the mountains of Northern Tipperary, and across the great lakes of the Shannon Valley. Lough Derg itself was as beautiful, on that day of rare Irish sunshine, as any Swiss lake could ever be. We could see the high tension cables of the Shannon power system, where the forces of that great river are harnessed for electric power. Limerick itself, great city of my childhood days, seemed to have shrunk into a little town, but it looked most clean and lovely from the air. We followed the winding and turning mouth of the Shannon down to Foynes and Ballylongford till at last the tiny village of Ballybunion—made historic by Col. Fitzmaurice and Capt. McIntosh from the Atlantic—lay in sunshine. We played about in the air for a long time, diving on the long bathing beaches where, being Ireland, the sexes are separated and there is a men's beach and a ladies' beach. High on the cliff we found the world's most beautiful field, 600 yards every way, waiting for our landing.

Ballybunion was wonderful. I have an aunt there who is very air-minded. She had let her house this summer to Mr. Reid, of Reid Turn Indicator fame, and the Reids and Auntie arrived within 10 minutes of our landing.

On the 30th we left Ballybunion and turned our noses northwards towards the Clare coast, diving irresolutely into a sheltered bay on the way—the Bay of Doon—which is reserved for the bathing of the local nuns.

We flew northwards over the hills of Clare and over the slopes of Slieve Elva and the blue waters of Galway Bay. From 2,000 ft., the waters were so clear that we could see fishes swimming and could discern, to the left, the littoral shelf 100 yards or so from the coast. The remains of an old aerodrome, Oranmore, lie 7 miles to the West of Galway.

To save the labour of my kindly B.P. petrol people we circled the town a few times and glided into land in a large open space between the town and sea. We were immediately surrounded by a bigger swarm of people than usual, and we found that we had actually landed in the Cladagh, a little district now entirely populated by fishing people, but which, up to 50 years' ago, had its own king and its own royal customs.

Galway has a huge future in front of it if it cares to use it. It is the only place north and south, all up and down the west coast of Ireland, where one could build a deep-water harbour with a straight approach from the ocean, and the swamp I landed on half-a-mile away could be made into the most marvellous aerodrome with a little expense of, perhaps, £1,000. It would be an ideal base for combined trans-Atlantic service of liner, seaplanes and aeroplanes.

Echo of First Atlantic Flight

I sallied forth next morning to find somewhere to come down near Senator Gogarty's house, "Renvyle," built on an island in the most north-western lake that Ireland owns. It was another perfect day and the high purple peaks of Connemara were too beautiful for description and so was Loch Corrib. Shifting bogs between them made me think with apprehension of that gallant adventure of Alcock and Brown. I went round Clifton and saw the very place where they landed, and the little open space that the Irish Free State Air Force used when flying to help the stranded French trawlers last winter. With faith in the D.H. "Moth," but qualms in my heart, I turned north-west and flew over the desolate barren land, so beautiful in its austerity, till I found the island home at the uttermost edge of Connemara. Fields there were in plenty, but they were the small holdings of the impoverished Irish peasants, and even with a 30-mile an hour wind blowing in from the great ocean I could not use any of them and had, perforce, to try a little strip of beach in the curve of the bold headland of the extreme north-west.

We half taxied and pushed the machine up the steep slopes of the shore and fastened it down with great sacks of stones tied to the wings and tail. Later in the day the tide rose within 5 ft. of the tail. For two days the machine was anchored there while my husband and I lived at the island. We managed to imbue Senator Gogarty with a passionate desire for a light seaplane.

A Landing on Quicksand

Once during our tour we landed in a quicksand where the machine gently settled down. Fortunately, the only damage done was to the tip of the Fairey-Reid propeller. I was able to taxi but the vibration was so excessive that I was afraid to fly. A long-distance trunk call at 10 p.m., from a remote telephone box in the heart of Ireland, woke the night watchman at Stag Lane. The De Havilland Aircraft Co., Ltd., had the spare propeller on the Irish mail at Euston at 8.30 the next morning and it was fitted within 24 hours.

It was impossible to take off that night, as sea fog covered the islands only 200 yards off. The next morning we got back to Baldonnel. Finally, we left Ireland with great regret.

FLYING CLUB MOVEMENT IN IRELAND

THE proposal to form a light aeroplane club in Belfast has created considerable interest, and the project is meeting with wide support. A meeting to consider the whole question was held in the Grand Central Hotel under the presidency of Captain R. L. Henderson. Preliminary arrangements will be made to put the scheme into operation. Brigadier-General Groves, C.B., C.M.G., D.S.O., Secretary-General of the Air League of the British Empire, intended addressing the meeting on civil aviation generally, and its application to Belfast, and so did Capt. Donald Drew, one of the pilots of the Short "Calcutta," but they were delayed. Mr. H. M. S. Catherwood is strongly in favour of the formation of a club and has promised it his support. The management of the Grand Central Hotel is also helpful and has placed a room at the disposal of the promoters for conferences and meetings. The provisional committee appointed consists of Captain R. L. Henderson, Mr. W. W. McLeod, Mr. R. L. Kemp, Mr. W. G. Scott, Captain Bouchier, Captain Herriott, Flight-Lieut. Briggs, Flight-Lieut. Preston, Major Adeley, Councillor D. Cheyne, and Mr. S. G. Haughton.

Flight-Lieut. Preston said he had obtained the names of a hundred interested people. With regard to an aerodrome, he thought the Belfast Harbour Commissioners might be willing

to consider placing some of the reclaimed land in the Lough at the disposal of the club at a reasonable rental.

The club would want flying members and ordinary members. A flying member could pay, say, a subscription of three guineas, and an ordinary member one guinea. A flying member might pay 30s. an hour for instruction, and as one could not learn to fly under twelve hours, this side of the sport would cost a member at least £18. Perhaps ladies could be accepted as members at a 25 per cent. reduction. If they could get enough members whose subscriptions would bring in about £420 it would be a good financial foundation. There were advantages in having a limited liability air club, and if Belfast adopted this method they might raise £2,500 in £1 6 per cent. preference shares, limiting a member to a maximum of twenty shares. If they could get the support of some generous men who would help the club in the way in which Sir Frederick Browning had helped the Liverpool Flying Club, by giving it an aeroplane, then the financial difficulties would be considerably eased.

Type of Machines

Dealing with the type of machine suitable for a flying club, Flight-Lieut. Preston said that in a country like

Ireland, where many fields would prove troublesome in the case of a forced landing, he thought machines of a bigger type would be suitable for an air club. He had an offer of two Renault Avros at £700 the pair, and although this type of plane was not of the latest, it was very reliable, and could stand more knocking about than a lighter machine.

He added that if the club were formed there might be some difficulty over Sunday flying. Many of the clubs over the water did most of their flying on Sundays, because it was the best day for business men.

Wing-Commander Wright, of the Ulster Bombing Squadron, said that a flying club would prove of great benefit to the business community. He had had many applications from business men, who wanted to make a hurried journey asking for one of the machines at Aldergrove to be placed at their disposal, but in every case he had been compelled to refuse, because Service machines could not be used for civil purposes. In the case of an air pageant being arranged to help the funds of the proposed club, he believed that the Air Ministry would

co-operate and perhaps send over aeroplanes from England to take part. Many applications from young men who wished to join the Air Force Reserve had been turned down because they had been unable to pass the medical test. Service flying was more strenuous than flying for pleasure, and if an air club were formed it would give these keen young men their opportunity to learn to fly. From the number of young ladies who had approached him (in vain) with a view to a flight in a Service machine he could have formed a strong air reserve force.

Mr. W. W. McLeod, referring to the activities of the Scottish Air Club in Renfrew, said that for every pilot trained the club received a subsidy from the Government. The club possessed three "Moths," two having been presented by influential men interested in civil aviation.

Professor Lloyd Dodd, of the Technical College, Professor Bradbury, and Councillor D. Cheyne also spoke, the latter observing that the question of transport on the roads was becoming such a serious one that new methods such as flying were demanding consideration.

LIGHT PLANE CLUBS

London Aeroplane Club, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.
Bristol and Wessex Aeroplane Club, Filton, Gloucester. Secretary, Major G. S. Cooper, Filton Aerodrome, Patchway.
Cinque Ports Flying Club, Lympne, Hythe. Hon. Secretary, R. Dallas Brett, 114, High Street, Hythe, Kent.
Hampshire Aero Club, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.
Lancashire Aero Club, Woodford, Lancs. Secretary, F. W. Atherton, Woodford Aerodrome, Cheshire.
Liverpool and District Aero Club, Hooton, Cheshire. Hon. Secretary, Capt. Ellis, Hooton Aerodrome.
Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Maj. Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.

Newcastle-on-Tyne Aero Club, Cramlington, Northumberland. Secretary, J. T. Dodds, Cramlington Aerodrome, Northumberland.
Norfolk and Norwich Aero Club, Mousehold, Norwich. Secretary, G. McEwen, The Aerodrome, Mousehold, Norwich.
Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria St., Nottingham.
The Scottish Flying Club, 101, St. Vincent Street, Glasgow. Secretary, Harry W. Smith.
Southern Aero Club, Shoreham Sussex. Secretary, C. A. Boucher, Shoreham Aerodrome, Sussex.
Suffolk Aeroplane Club, Ipswich. Secretary, Maj. P. L. Holmes, The Aerodrome, Hadleigh, Suffolk.
Yorkshire Aeroplane Club, Sherburn-in-Elmet, Yorks. Secretary, *Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

REPORT for week ending October 14.—Total flying time, 46 hrs. 40 mins. Dual, 26 hrs. 30 mins. Solo, 20 hrs. 10 mins.

Instructors: V. H. Baker and F. R. Matthews. Ground engineer: C. Humphreys.

Flying instruction was given to 39 members and 34 members flew solo. A. C. Thomas made his first solo flight on Sunday, 14.

On Saturday, for the first time for many months, the members had the pleasure of seeing the whole of the Club Aircraft on commission, but, as is so often the case, the pleasure was short-lived. On Sunday Miss Wilson, flying solo on G-EBMF, alighted in a field next to the aerodrome and taxied into the fence. The machine turned completely over and considerable damage resulted; in fact, it might entail a write off. Miss Wilson fortunately escaped unhurt.

During the week-end, advantage was taken of the temporary membership and the following members who have permission to take up passengers were busy giving flights to their friends:—M. L. Bramson, E. E. Stammers, O. J. Tapper, T. Elder Hearn.

Membership.—The Club is now in a position to elect a few additional members who can take instruction during the week days.

BRISTOL & WESSEX AEROPLANE CLUB, LTD.

REPORT for the week ending October 13.—Flying time for the week, 17 hrs. 30 mins. Eight pupils under instruction, 10 hrs. flown. Two soloists under instruction, 1 hr. 25 mins. flown. Three "A" pilots flew 4 hrs. 45 mins. Pilot instructor for the week, E. W. B. Bartlett. Ground engineer, A. W. Webb.

The week has been bad for instructional flying—a lot of rain and rough weather. Mr. Downes Shaw flew to Croydon and back with Major Cooper as passenger. We are busy preparing for an "At Home" on Saturday next, the 20th. It is hoped that a good number of private owners will come, as well as representatives from other clubs. Invitations have been issued to clubs within reasonable distance, and a hearty welcome is assured to any others who have not been so invited. Visitors will be put up for the night by members of this club and their machines will be housed. There will be displays of aerobatics and joy-riding and a competition for visiting and other machines. Visitors are asked to arrive before the commencement of flying at 2 p.m. and to inform the Secretary of their intention of doing so.

CINQUE PORTS FLYING CLUB

REPORT for week ending October 13, 1928.—Total flying time, 7 hrs. 15 mins. Test flights, 35 mins. Joyrides (with Maj. Clarke), 3 hrs. 30 mins. (with Maj. Travers), 1 hr. 10 mins. Machines, Moth S.S. and N.N. Pilot Instructors, Maj. I. N. C. Clarke, D.S.C., and Maj. H. G. Travers, D.S.C. Ground Engineer, Mr. R. H. Wynne.

Dual Instruction (with Maj. Clarke): Capt. Took, 30 mins.; Mr. Wood, 30 mins.; Mr. Swinnard, 15 mins.; Mr. Clemetson, 45 mins.; Mr. Worsell, 45 mins.; Mr. Sargent, 15 mins. (With Maj. Travers) Mr. R. Dallas Brett, 30 mins.; Mr. Skinner, 15 mins. Total, 3 hrs. 45 mins.

Soloists under instruction: Mr. Mackinnon, 45 mins.; Mr. Walsh, 30 mins. Total, 1 hr. 15 mins.

"A" Pilots: Mr. Mackinnon, 45 mins.; Mr. Skinner, 15 mins. Total, 1 hr.

On Monday, the 8th inst., Maj. I. N. C. Clarke, D.S.C., resigned the position of Pilot Instructor for private reasons, and on Friday, the 12th inst., Maj. H. G. Travers, D.S.C., was appointed temporarily to fill the post. The Club was most fortunate in securing the services of Maj. Travers. There is a possibility that he may accept a permanent appointment.

Major H. G. Travers comes from Walmer. He served in the H.A.C. from 1913 to 1915, going overseas with them in September, 1914. He was wounded in December, 1914, and on emerging from hospital he transferred to the Royal Naval Air Service in December, 1915, taking his certificate as a pilot in January, 1916. After service at Eastbourne and Dover, he served overseas at Dunkirk towards the end of 1916. In January, 1918, he was appointed

to command No. 211 Squadron of the Naval Wing with the rank of Major. He left the Service in September, 1919, and during the period from September, 1926, to December, 1927, he served as test pilot and personal representative for Mr. Robert Blackburn, the well-known aircraft constructor, at Messrs. Blackburn's depot for land and sea 'planes at Phaleron, Greece. He has recently been temporary pilot instructor to the Bristol and Wessex Club.

On Sunday, Mr. Graham Mackinnon, a member from Edenbridge, went for his flying tests for his Air Ministry "A" licence and succeeded in passing in very good style. The Club congratulates Mr. Mackinnon on a most excellent performance.

On Saturday, the 13th inst., Mr. G. T. Skinner, of Boughton Honchelsea, near Maidstone, who recently passed his flying tests for the Air Ministry "A" licence, took off in Moth G-EBSS for a solo flight, immediately after having 15 minutes' dual instruction with Maj. Travers. He climbed to a considerable height above Romney Marsh and proceeded to do two excellent loops, after which he successfully did a half-roll. In attempting a full roll immediately afterwards he allowed the nose to drop and the roll developed into a spin. He was still at a perfectly safe height, but it appears that he came out of the spin with a jerk and was thrown forward on to his belt, which broke near the starboard fastening. Mr. Skinner was thrown out of the machine, and, of course, instantly killed. The machine continued in a vertical dive and landed on Selby Farm close to Mr. Skinner, being reduced to a complete wreck.

The Club deeply regrets this most unfortunate accident to a very promising pupil, and the Board of Directors and Committee offer their sincere sympathy to Mr. Skinner's relations and friends in their great loss.

HAMPSHIRE AEROPLANE CLUB

REPORT for week ending October 13.—Flying time for the week, 33 hrs. 55 mins. Pupils under instruction (32) 16 hrs. 30 mins.; soloists (8), 9 hrs. 10 mins.; "A" pilots (11), 6 hrs. 15 mins.; tests and passengers, 2 hrs.

Pilot Instructors: F/Lt. F. A. Swoffer and Mr. W. H. Dudley. Ground Engineer, Mr. E. Lenny.

We were glad to welcome the following members this week, all of whom have enrolled in the pilot grade:—Captains Combe and Tweed and Messrs. Vernon, Harrison and Miller.

Mr. Coode made a successful first solo on Wednesday after 5 hrs. of dual instruction.

Messrs. Evershed and Whittle have now completed their tests for their "A" licences. Mr. Whittle distinguished himself by landing fairly on the mark after his height test, during which he reached an altitude of nearly 8,000 ft. Mr. Evershed completed his tests just a week after achieving his first solo flight.

On Sunday we were pleased to see Sir Sefton Brancker, who looked in for a cup of tea and a chat. For a change, he did not arrive in C-EDCA, but came down by road instead.

On Wednesday we were visited by F/Lts. D'Arcy Greig and Stainforth, and F/Os. Atcherley and Moon, who constitute the speed flight at present stationed at Calshot.

Mr. Lenny has been to Croydon and returned with a new Mark II Cirrus engine from the A.D.C. works. In consequence, we hope to add considerably to our flying time.

LANCASHIRE AERO CLUB

REPORT for week ending October 13.—Flying time, 22 hrs. 50 mins. Instruction, 9 hrs. 45 mins.; solo flights, 6 hrs. 30 mins.; passenger flights, 5 hrs. 5 mins.; tests, 1 hr. 30 mins.

Instruction (with Mr. Hall): Messrs. Heath, Cohen, Ashworth, J. H. Foote, Miss Baerlein, Gort, Faulkner, Mason, Miss Emery, Kay, Elwell, Secker, Miss Swithenbanks, Barlow, Whitehouse, Ashworth, W. Ginger, Harrison, Dane; (with Mr. Cantrill): Riley.

Pilots: Messrs. Heath, Cohen, Nelson, D. Mills, Ruddy, Caldecott, Hall, R. F. Twemlow, Meads, Harrison.

Passengers (with Mr. Caldecott), Ramsden, Dunlop, Percival, Lee; (with Mr. Lacayo), Faulkner, Miss Worsley, Benson, A., Miss Cunliffe; (with Mr. Hall, R.F.), Miss Greenhalgh, Davies, R. G.; (with Mr. Hall, R.F.), Frith; (with Mr. Elwell), Miss Bell; (with Mr. Leeming), Twort, Miss Bell; (with Mr. Hall), Mitchell.

LIVERPOOL & DISTRICT AERO CLUB

REPORT for week ending October 13.—Total flying time, 27 hrs. 10 mins. Dual, 18 hrs. 5 mins. Solo, 6 hrs. 40 mins. Joy rides, 1 hr. 15 mins. Test, 1 hr. 10 mins.

The above times reflect the keenness of our Flying Members and Staff, as poor visibility has made flying far from pleasant most of the week.

On Sunday last, Messrs. Keniston and Edgar were launched solo, each putting up a very good show. Mr. Edgar's landing was perhaps the best first solo landing one has seen to date.

Mr. Howard Pixton, our Ground Engineer, is still battling with repairs and overhaul to XY. Meantime, XX is totting up the hours, and will be due for top overhaul as soon as XY is back to work. Motto for ground engineers, "One damn' thing after another."

Capt. Ellis, our new secretary, has taken over his duties this week, and is now installed at the Aerodrome Office!

MIDLAND AERO CLUB

REPORT for week ending October 13.—The total flying time, 32 hrs. 34 mins. Dual, 13 hrs. 55 mins. Solo, 12 hrs. 40 mins. Passenger, 5 hrs. 20 mins. Test, 39 mins.

The following members were given dual instruction by Flt.-Lt. T. Rose, D.F.C., and Mr. W. H. Sutcliffe:—M. C. Wilks, E. P. Lane, D. N. Khatie, C. T. Davis, R. G. Welch, T. W. Wild, J. K. Morton, F. J. Steward, W. J. Halland, E. L. Hulme, W. L. Handley, H. Smith, G. Potter, F. D. Scott, L. V. Mann, J. A. Ridsdale, Mrs. Leigh-Fermor, Dr. W. G. Tilleke.

"A" Pilots.—E. P. Lane, E. R. King, R. L. Jackson, G. Savage, R. C. Baxter, E. L. Hulme, S. L. Duckitt, H. Lattey, G. C. Jones, F. J. Steward, G. Robson, J. Rowley, W. Swann, Dr. N. J. Nock.

Soloists.—Dr. W. G. Tilleke, W. J. Halland, J. Fitzgerald, J. W. Astley, D. N. Khatie, J. K. Morton, M. C. Wilks.

Passengers.—E. Hanson, Dr. Johnson, W. J. Lord, G. Potter, J. E. Hicks, W. Swann.

On Saturday Mr. M. C. Wilks made his first solo. During the winter months it has been arranged that flying shall take place every day in the week from 10 a.m. till dusk.

NORFOLK & NORWICH AERO CLUB

REPORT for week ending October 14.—Total flying time, 7 hrs. 20 mins. Dual.—Messrs. W. S. Coates, C. Ransom, G. Harding, Mrs. Birkbeck. Soloists.—Messrs. W. S. Coates, C. Ransom, L. Lowen, Mrs. Cator.

The weather has spoilt all flying for the greater part of the week, and having only one machine left, it is very difficult to keep things going.

Mr. C. Ransom has accomplished his tests for "A" Licence this week in good form.

The Club Ball, on November 9, is a date to remember. This is the finest

ball in Norwich, and includes a really first-class cabaret show. Tickets, single, 12s. 6d., and £1 1s. double, can be obtained from the secretary, but early application is advised, as there is such a big demand locally for them.

NOTTINGHAM AERO CLUB

REPORT for week ending October 5.—Flying time, 16 hrs. Instruction, 5 hrs. 15 mins. "A" Pilots, 7 hrs. Solo (under instruction), 1 hr. 25 mins. Passengers, 14 hrs. 5 mins. Tests, 1 hr. 15 mins.

Instruction (with Mr. Martin): Messrs. Hall, Thorpe, Cudlip, Kay, Cox.

Solo "A" licence: Messrs. Wynn, Pilgrim, Whitby, Paul, Taylor, Bradley, Selvey.

Solo (under instruction): Messrs. Winn, Hall.

Passengers: Miss Vickers, Miss Ford, Messrs. Paul, Spalding, Richards, Sedgwick.

We have lost two days' flying this week, as the necessary permission from the Royal Air Force to use Hucknall Aerodrome for a further period did not come through till Tuesday. We can now use the Aerodrome until December 1, at the discretion of the O.C. 504 (B) Squadron, which is now stationed here, and we are very grateful for this concession as our new aerodrome at Tollerton (S. Nottingham) is far from being ready. Our flying time is much lower than it has been for months, as we only flew on four days.

REPORT for week ending October 12.—Flying time, 16 hrs. 5 mins. Instruction, 2 hrs. 15 mins. "A" Pilots, 9 hrs. 40 mins. Solo (under instruction), 1 hr. 50 mins. Passengers, 50 mins. Tests, 1 hr. 30 mins.

Instruction (with Mr. Martin): Messrs. Cudlip, Chawla, Kay.

Solo "A" licence: Messrs. Bradley, Selvey, Taylor, Cox, Paul.

Solo (under instruction): Messrs. Hall, Chawla.

Passengers: Miss Overton, Miss Bostock, Miss Moore, Messrs. Spalding, Backay, Granger, Crompton, Ford.

The weather during this week has been the worst we have experienced since last winter, and consequently our flying time is still low. Our dear friend "Horace" made a perfect landing about 30 ft. up or so on Sunday last, resulting in the attitude of a diving duck. However, the damage was very slight, so we have let him off with a caution this time.

SUFFOLK & EASTERN COUNTIES AEROPLANE CLUB

REPORT for week ending October 13.—Flying time, 8 hrs. 20 min. Instruction, 5 (4 hrs. 15 min.). Soloists, 2 (1 hr. 40 min.). "A" Pilot, 1 (35 min.). Passengers, 12 (1 hr. 25 min.). Instructor, G. E. Lowdell, A.F.M. Ground engineers: "C," E. Mayhew; "A," G. Keeley.

Dr. J. C. Sleight accompanied by Miss Sleight, aged six, paid an aerial visit to friends in the neighbourhood last Sunday, and landed in the grounds to partake of a dish of tea.

We notice that Hampshire have only one aeroplane and heaps of members. Our trouble is that we have three aeroplanes and only one member; or to be more accurate, we have not got sufficient active members to take full advantage of the facilities offered for learning to fly at Hadleigh. If any readers want to learn quickly they should blow along to Suffolk.

We are arranging for a local motor-cycle club to hold a social run, with the aerodrome as their objective.

Three's Company!

THE Hon. D. Tennant flew his D.H. "Moth" from Stag Lane to Lympne on October 14 with his wife and Mr. B. Howard in the front cockpit. At Lympne he was stopped from crossing the Channel with his passengers thus placed, so he first flew Mr. Howard over to St. Inglevert, and then

returned for Mrs. Tennant. Later they reached Le Bourget. For America

LADY HEATH is to make an air tour of America in November. She has toured Europe, Africa and Ireland since a year ago in various types of light aeroplanes. Lady Heath will use her D.H. "Moth" in America.

THE PORTUGUESE FLIGHT TO AFRICA

In our issue for September 20 last, we reported the opening stages of an ambitious flight now being undertaken, by two Portuguese pilots, from Lisbon to Portuguese East Africa. This week we are able to give further news of their progress. The airmen are Capt. Pais Ramos and Oliveira Viegas, who are accompanied by Lieut. Jose Esteres and Sergt-Mechanic Manuel Antonio. They are flying two Vickers "Valparaiso" biplanes fitted with Napier "Lion" engines.

Leaving Lisbon on September 5, they completed the stages Casablanca-Agadir-Cape Juby (1,124.5 miles) on September 6. Proceeding by the following stages: September 7, Port Etienne (6,835 miles); September 8, St. Louis (404 miles); September 9, Bolama (354 miles), they completed the first part of their venture, having covered 2,566 miles in 24 hrs. 9 mins. flying time, at an average speed of 105.6 m.p.h.

After a few days' stay at Bolama they continued their journey on September 14, and, making a forced landing at Tambacoundo owing to torrential rain and shortage of fuel, eventually reached Kayess, Upper Senegal (354 miles) on September 15. Proceeding next day, 298 miles to Bamako

was accomplished, and on September 17 two more stages were completed—Sikasso (207 miles) and Bonake (298 miles), both in Senegambia—in all 507 miles. On September 18 they arrived at Bingerville, French Ivory Coast (198.8 miles), where a few days were spent in overhaul. Starting again on September 21, the Portuguese airmen flew 298.8 miles to Accra and as follows:—September 22, Lagos (300.75 miles); September 23, Duala, or Donala (497 miles); September 27, Port Gentil, and on September 29 they paid a visit to the island of St. Thomas, where they received an enthusiastic reception. On October 2 they returned to Port Gentil, whence the "raid" was continued towards Loanda.

So far this has been a most remarkable flight (of over 5,000 miles), especially considering, first, that the Vickers "Valparaiso" biplanes and their Napier "Lions" have already seen several years' service in the Portuguese Air Force; secondly, that there has been only one mechanic to look after the two machines throughout, and thirdly, that the route, at certain sections in particular, is a by no means ideal one.

was won by W. H. E. Drury, a 22-year old pilot, in a Waco powered with a Wright Whirlwind. His time over the 2,145-mile course with its nine controls, including three night stops, was 17 hrs. 55 mins. 41 secs. His companion on the flight was M. E. Oliver, of Ann Arbor, Mich. Drury is a native of St. Catherine's, Ont., and learned to fly in a small school at Windsor last year. He has flown less than 200 hours and had never done cross-country flying before.

Kenneth E. Whyte and H. R. Campbell, members of the Hamilton Aero Club, who purchased a D.H. "Moth" ("Cirrus") especially for the race, were second in 27 hrs. 50 mins. 17 secs. The other three starters, including Eddie Stinson, in Stinson Detrouiter, were forced out by trouble on the way.

U.S. NATIONAL AIR RACES

(Concluded from p. 905.)

John Livingston, in a Waco powered with a Wright Whirlwind, won the class "B" (engines of 510-800 cub. in.) in 22 hrs. 56 mins. 59 secs. There were 13 controls in this division, nine 30-min. day stops and four night stops.

Robert W. Cantwell won class "C" (more than 800 cub. in.) in his Lockheed Vega (Wasp). His elapsed time was 21 hrs. 9 mins. 1 sec. Capt. C. B. D. Collyer, in the Fairchild Wasp, in which he raced around the world, was second in 24 hrs. 10 mins. 45 secs.

The international race was started at Windsor on Sunday, September 9; (when the city's airport was dedicated), and



Sir Philip Sassoon's Air Cruise

SIR PHILIP SASSOON, the Under-Secretary for Air, returned to Cairo on October 11, after completing a flight of 2,500 miles in 20 hours from Khartoum, and then left for Baghdad in the Blackburn "Iris" (Rolls-Royce "Condors") flying-boat on October 12, to continue his cruise to the East. On October 13 he landed at Basra with Air Vice-Marshal Sir Edward Ellington. On the next stage towards Karachi there was a forced landing at Jask. The trouble was soon rectified and the flight resumed on October 15. On that date at 3.23 p.m. Karachi was reached safely, a good landing being made in the harbour. The stage had taken about eight hours. Sir Philip Sassoon was received by Air Vice-Marshal Sir Geoffrey Salmond, Wing-Comdr. R. J. Bone, and other officials. The Guard of Honour was inspected and the Under-Secretary drove to the Government House.

Tasman Sea Re-flown

CAPT. KINGSFORD-SMITH and Mr. C. Ulm, who flew the Pacific in the "Southern Cross" monoplane, made a successful return flight across the Tasman Sea from New Zealand to Australia on October 13-14. They started from Blenheim at 4.54 a.m. Two Government aeroplanes provided an escort for the first 100 miles. They reached the Australian coast during the night after flying 1,500 miles over sea, ran into a thick belt of fog, and wandered for two hours between Newcastle and Sydney, unable to determine their position. But at 2.15 a.m. a safe landing was made at Richmond Aerodrome with only 3 gallons of petrol left. Conditions were favourable for the flight at the beginning, and wireless communication was made.

Autogiro Tour

FLYING-OFFICER RAWSON landed the Cierva Autogiro ("Lynx") at Le Bourget on October 13 after the European tour. The last stage had been from Berlin, where the machine had attracted wide and keen interest. Senor de la Cierva had been personally invited to Berlin during the Berlin Aero Show by Lufthansa.

German Far-East Flight

THE progress of Baron von Huenefeld, the German airman, on his Far East flight in the Junkers' "Europa" monoplane brought him to Shanghai from Canton on October 15. He started from Berlin and is trying to reach Tokyo. He anticipated flying non-stop to Tokyo from Shanghai in 18 hours.

Returning

CAPT. W. L. HOPE, after being forced to abandon his flight to Cape Town via Kenya, left Khartoum, on October 10, for Wadi Halfa. He was at Malakal on October 3. This flight started from Stag Lane on September 11.

Adrift for Twelve Hours

THE crew of a French mail plane operating between Algiers and Marseilles were adrift at sea for twelve hours, when their machine sank off the Balearic Isles on October 10, following a forced landing through engine trouble. The machine was destroyed by fire and the crew took to the raft that was carried. Land was reached after the twelve hours.

"Miss Columbia" Again

AN attempted flight from New York to Rome in the Bellanca monoplane, "Miss Columbia," owned by Mr. C. Levine, who crossed the Atlantic in it, piloted by Mr. C. Chamberlin, ended in a crash at the take-off on October 11. The pilot, Mr. Roger Q. Williams, and navigator, Mr. Bohelli, were unhurt, but the machine was badly damaged. The load was too great. Repairs will follow, and another attempt made, probably in six weeks' time. Mr. Levine was not of the crew.

Prospecting Plane Crashes

A MACHINE used for prospecting in the Hudson Bay region crashed on a reef recently. One man perished; another was badly frost-bitten. Six of the crew of seven were taken off by a tug, which rushed to the rescue in response to a wireless message.

"Moth" Construction in America

AN American company, named the Moth Aircraft Corporation, has been formed in Delaware to manufacture D.H. "Moths." The Chairman is Mr. Minton M. Warren, who said that they had obtained the exclusive manufacturing rights in America. The De Havilland Aircraft Company, of England, confirm this.

Aviation Activity in Sweden

A PROPAGANDA flight around Sweden, a daily winter route linking Sweden with the Continent, and a plan to construct air ports in practically every Swedish city, are the latest proofs of the great Swedish interest in the development of commercial flying. Capt. Ahrenberg, the "star" pilot of the Aero-transport Co., has just returned to Stockholm with his machine, a Junkers F.13, after a tour of five months around entire Sweden, during which he visited practically every city in the country, made 2,338 ascents, carried over 10,000 passengers, and brought his company a profit of 120,000 kronor. The Swedish Aviation Society has addressed a letter to the municipal authorities of all Swedish cities, pointing out that aviation is now so safe and reliable that it must be regarded as a regular means of transportation and that every city should therefore establish its own municipal aerodrome. The society is elaborating standard plans for such aerodromes to be constructed at low cost, and these plans will be submitted to the various communities. The Aero-transport Co. reports it will this year operate the first direct daily air service to the Continent. The Dutch K.L.M. Aviation Co. will maintain daily traffic between Malmö and Amsterdam by means of two comfortable and well-heated twin-engined Fokker machines. This line will enable travellers to Paris and London to save about 18 hours in transit between Sweden and the French and English capitals.

Air Mail via "Leviathan"

THE American pilot, Mr. C. Chamberlin, took off from the "Leviathan" to Berlin with mails and two passengers at Cherbourg on October 12, and landed at Le Bourget. Bad weather delayed a resumption to Berlin. His machine is a Loening Amphibian.

England-India Service

IMPERIAL AIRWAYS will open the Basra-Karachi section next January. When the London-Cairo service begins in April, the flight between London and India will take 4 days. A night will be spent at Genoa, Cairo, and Basra. Refuelling will be done at Alexandria and Bushire. The passenger fare will be £112.

Dover-Calais

A FRENCH air service between Calais and Dover and *vice-versa* will be commenced shortly with four-seater seaplanes. The fare will be £2 10s.

New Italian Air Line

BETWEEN Naples, Genoa, Palma (Majorca) and Barcelona an Italian seaplane service is to be started soon and will link up with other existing lines.

General de Pinedo Promoted

GENERAL ARMANT, Chief of Staff of the Royal Italian Air Force, who was injured in a flight last July, is, at his own request, being relieved of his post for reasons of health. Meanwhile, General de Pinedo, who has carried out many notable flights in recent years, has been appointed Chief of Staff.

A Loening Air Yacht

MR. DONALD WOODWARD, of Le Roy, New York, has just ordered from the Loening Aeronautical Engineering Corporation one of their newest series Loening Cabin Amphibians, fitted with a Pratt and Whitney "Hornet" engine. This machine will be equipped as a luxurious air yacht for Mr. Woodward's personal use, and will embody all the latest Loening features, such as side-by-side dual control, easy access from cabin to pilot's cockpit, hydraulic shock-absorbers in the landing gear, and a new-type stabiliser adjustment. This amphibian seats eight people, has a top speed of 130 m.p.h., a cruising speed of 110 m.p.h., and a quick take-off from land or water.

Mystery of Col. Fawcett

COMMANDER G. DYOTT has returned to New York from Brazil where he searched for the missing explorer, Col. Fawcett. He stated that he was still convinced of the explorer's death.

Airship M.P. to Resign

COMMANDER BURNEY, M.P., has announced his decision not to stand for Parliament again at the next General Election. His airship schemes take up most of his time now. Mr. Baldwin has written stating that, in view of the tremendous importance of the airship schemes, he approves of the decision of Commander Burney.

THE ROYAL AIR FORCE

London Gazette, October 9, 1928

General Duties Branch

The following are granted temporary commissions, as Flying Officers on attachment for duty with R.A.F. (Sept. 30):—Lt. J. H. Charsley, R.N., Sub-Lt. I. C. Rowe, R.N., Mate R. W. Wicks, R.N. The following are promoted, with effect from Oct. 10:—Flt. Lieuts. to be Sqdn. Leaders.—R. W. Chappell, M.C., A. H. Wann, T. W. Elmhirst, A.F.C., H. S. Kerby, D.S.O., A.F.C., W. Helmore, G. C. Rhodes, J. A. Sadler, A. G. Bishop, A.F.C. Flying Officers to be Flt. Lieuts.—G. A. R. Muschamp, J. R. D. Goadsby, S. C. Black, M.M., R. E. Bain, E. B. Addison, F. C. T. Rowe, W. C. Yale, R. S. Blucke, C. F. Sealy, W. C. P. Bullock, J. B. Barrett, H. W. Taylor.

The following Pilot Officers are promoted to rank of Flying Officer:—H. C. Marett (Jan. 14); B. A. J. Crummy (Jan. 14); G. N. S. Lane (Sept. 19).

Flying Officer F. W. Mundy is transferred to Reserve, Class A. (Oct. 4); Flying Officer (Hon. Flight Lt.) L. S. Hamilton resigns his short-service commission. (Aug. 29); Flying Officer M. M. Miln relinquishes his short-service commission on account of ill-health (Oct. 9); Lt. J. W. Hawkins, R.N., Flying Officer, R.A.F., relinquishes his temp. commission on return to Naval duty (Aug. 16).

Stores Branch

The following officers are placed on retired list on account of ill-health:—Flt. Lieut. J. Lundon (Oct. 8); Flying Officer O. W. T. Rogers (Oct. 9).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commanders: F. L. Robinson, D.S.O., M.C., D.F.C., to No. 10 Sqdn., Upper Heyford, to command, 21.9.28. E. R. Manning, D.S.O., M.C., to No. 7 Sqdn., Worthy Down, pending taking over command, 1.10.28. A. D. Cunningham, C.B.E., to No. 5 Flying Training Sch., Sealand, to command, 1.10.28. P. Babington, M.C., A.F.C., to H.Q., Inland Area, for Personnel Staff duties, 1.10.28.

Squadron Leader B. McEntegart, to Air Ministry (dept. of Chief of Air Staff), 2.10.28.

Flight Lieutenants: G. E. Gibbs, M.C., to Central Flying Sch., Wittering, 2.10.28. R. Pyne, D.F.C., to Central Flying Sch., Wittering, 2.10.28. S. H. Ware, to Station H.Q., Catterwater, 2.10.28. E. A. C. Britton, D.F.C., to

Accountant Branch

Pilot Officer on probation C. Rendle resigns his permanent commn. (Sept. 14). (Substituted for *Gazette*, Oct. 2.)

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

H. D. Makgill-Crichton-Maitland is granted a commn. in Special Reserve as Pilot Officer on probation (Sept. 3); Pilot Officer on probation H. J. Padfield is confirmed in rank (Sept. 13). The following Flying Officers are transferred from Class A to Class C:—E. Fulford (Oct. 5); V. C. Cordingley (July 29); A. H. Padley (June 7); A. I. Riley, A.F.C. (Oct. 5). Flying Officer H. J. Phillips is transferred from Class AA to Class C (Aug. 4); Flying Officer H. C. E. C. P. Dalrymple is transferred from Class C to Class A (Sept. 26). Flying Officer W. Dougall resigns his commn. (May 24); Pilot Officer C. S. Dawson relinquishes his commn. on account of ill-health and is permitted to retain his rank (Oct. 10).

AUXILIARY AIR FORCE

General Duties Branch

The following to be Pilot Officers:—No. 603 (City of Edinburgh) (Bombing) Sqdn.—A. Wallace (Sept. 11). No. 605 (County of Warwick) (Bombing) Sqdn.—S. J. Huns (Aug. 10).

No. 39 Sqdn., Bircham Newton, 15.10.28. J. C. Stevens, to Armament & Gunnery Sch., Eastchurch, 24.9.28. E. H. M. David, to Superintendent of Reserve, Hendon, 1.10.28. C. E. Maitland, D.F.C., to Schl. of Photography, Farnborough, 10.10.28.

Flying Officers: C. R. Mason, to R.A.F. Station, Kenley, 5.10.28. N. H. N. Fletcher, to Central Flying Sch., Wittering, 25.9.28.

Stores Branch

Flight Lieutenant H. Cartwright, to No. 4 Stores Depot, Ruislip, 9.10.28.

Medical Branch

Flying Officers: P. B. L. Potter, M.B., to Med. Training Depot, Halton, 2.10.28. J. L. Groom, N. M. Jerram, G. W. Paton, M.B., R. W. N. Robins, M.B., B.A., and G. O. Williams, B.Sc., to Medical Training Depot, Halton, on appointment to Short Service Comms., 2.10.28.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

A SPEED Competition for model aeroplanes for a cup value £20 will be held at Hendon Aerodrome at 3 p.m. on Saturday, October 20. The competition is an open one, the fee for non-members being 1s. The models must have a fuselage, and the main plane area must not exceed one square foot. Any type of power plant may be used. The models must rise from the ground without any assistance from the competitor. The winner to hold the Cup for one year, and be awarded a silver medal and 10s.; second prize, a bronze medal; third prize, diploma.

There are several "Hush-hush" models which have been built and tried successfully for this competition, and speeds of 50 m.p.h. or more are being freely talked of.

An Open Competition for non-members only will be held on Wimbledon Common at 3 p.m., Saturday, October 27. Any type of model aeroplane may compete, and they will be launched by hand. The best duration of three flights to count. First prize, silver medal; second prize, bronze medal; third prize, diploma. Competitors' entries will be accepted on the ground at 3 p.m.

On the same afternoon, the Freshmen's Competition takes place. This is for members of the S.M.A.E., who did not win any prize during 1927. Model must have a fuselage, and will be hand launched. The best duration of three flights to count. Prize, diploma and 10s.

If postponed on account of weather, these two competitions will be held the following Saturday without further notice. A party of L.C.C. schoolboys has been invited to witness these two competitions. The ground is on the south side of the Windmill.

W. E. EVANS, Acting Competition Secretary.

GRAF ZEPPELIN ATLANTIC VOYAGE

(Concluded from page 903)

Count Brandenstein, son-in-law of the late Count Zeppelin. Fifteen bags of mail weighing 76 lb. were carried. Drinking water was taken in the form of ice blocks, which were also used for preserving food. A premium of £10,000 was paid for insurance.

The *Graf Zeppelin* is driven by five Maybach engines of 530 h.p. each. She carried 25,000 cub. m. of a new gas fuel, besides a reserve of 15 tons of petrol, and the estimated maximum endurance capacity was 5 days and nights, and range, 12,427 miles. The length of the ship is 771 ft. and height 100 ft. Cruising speed is 65 m.p.h. and top speed 80 m.p.h. The ship was considered to possess a measure of seaworthiness if forced down at sea.

Airship Records

The *Graf Zeppelin*'s time of nearly 112 hrs. constitutes a duration record.

The R.34 was the first airship to cross the Atlantic and the only one to make a return flight. In July, 1919, it flew from Scotland to New York in 108 hrs. 12 mins., commanded by Maj. Scott, and did the return flight to Pulham, Norfolk, in 75 hrs. 3 mins., or 3 days, 3 hrs. and 3 mins.

The ZR.3 took 80 hrs. 30 mins. for the outward flight in October 1924, commanded by Dr. Eckener.

NEW COMPANY REGISTERED

BROOKLANDS SCHOOL OF FLYING, LTD., Brooklands Aerodrome, Byfleet, Surrey.—Capital £3,000, in £1 shares. Instructors in aviation, aerial navigation, aerial and ground signalling, etc. Directors: H. D. Davis (chairman), H. S. Hamilton, L. R. Oldmeadow. Solicitors: Richard Brooks and Son, 11-12, Finsbury Square, E.C.2.

PUBLICATIONS RECEIVED

Jaguar Series IIIA Aero Engine. Air Publication 1082. H.M. Stationery Office, Kingsway, London, W.C.2.

Annual Report of the Director of the Meteorological Office for the Year ended March 31, 1928. H.M. Stationery Office, Kingsway, London, W.C.2. Price 1s. 6d. net.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1927

Published October 18, 1928

- 7,675. U. ANTONI. System of construction for hulls. (279,776.)
- 18,017. J. S. DREWRY and SHELVOKE & DREWRY, LTD. Apparatus for lifting and towing aeroplanes. (297,519.)
- 18,616. L. G. FRISE, F. S. BARNWELL and BRISTOL AEROPLANE CO., LTD. Control devices for aeroplanes. (297,533.)
- 19,525. DE HAVILLAND AIRCRAFT CO., LTD., and H. S. BROAD. Harness for airmen. (297,541.)
- 25,097. F. H. PAGE and HANDLEY PAGE, LTD. Bomb-dropping release gears. (297,574.)
- 29,152. MITSUBISHI NAIENKI KABUSHIKI KAISHA. Method of constructing the required wing form of flying-machine. (290,994.)

APPLIED FOR IN 1928

Published October 18, 1928

- 8,079. SIEMENS & HALSKE AKT.-GES. Valve gear of radial-cylinder i.c. engines. (289,006.)

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